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NANTICOKE

ENVIRONMENTAL MANAGEMENT PROGRAM

NETWORK DATA SUMMARY

FOR 1981

Report No. ARB-144-83-ARSP

OCTOBER 1983

Participants:
ENVIRONMENT CANADA
ONTARIO MINISTRY OF THE ENVIRONMENT
ONTARIO HYDRO
STELCO INC.
TEXACO CANADA INC.

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1. INTRODUCTION:

The Nanticoke Environmental Management Program (NEMP) is a co-ordinated study into the impact of industrial development in the Nanticoke area on air quality in the Haldimand-Norfolk region. It is jointly sponsored by the Federal and Provincial governments, Ontario Hydro, Stelco and Texaco. The NEMP monitoring network, established in the fall of 1978, was operated throughout 1981 to measure adherence to air quality criteria (AQC) for the protection of human health and comfort as well as that of vegetation, animal life and property. In addition to the NEMP network, Ontario Hydro has been operating an SO_2 network of approximately 16 monitors since 1970 and MOE West-Central Region has been operating gaseous monitors at Cheapside and Simcoe as well as a hi-vol network consisting of 6 samplers.

The Haldimand-Norfolk region is situated on the northern shore of Lake Erie in the midst of a major industrial complex comprised of a thermal generating station, a steel plant and an oil refinery. Ontario Hydro, Stelco and Texaco operated throughout most of 1981. Table 1 outlines the major emission sources and their 1981 emission estimates for sulfur dioxide and particulate matter. Emissions from Ontario Hydro's generating station are released from two 198-metre stacks (separated by 275 m), whereas emissions from Stelco and Texaco emanate from stacks as well as low-level sources. Monitoring stations have been located according to criteria that take into account predominant wind patterns and source configuration, as well as in reponse to concerned citizens. The network configuration for 1981 remained the same as for 1980 except for the relocation of a hi-vol sampler (SW37 moved to SW40) in January. Figure 1 shows the location of monitoring stations and Table 2 lists the parameters monitored at each location.

This report complements the second data summary report covering network data up to December 1980 (4) and summarizes the data collected by the NEMP network during 1981.

2.0 Gaseous Data Analysis

2.1 Analysis of Sulfur Dioxide (SO_2) Data:

Hourly averaged SO_2 concentrations were monitored at twenty locations during 1981. Sixteen stations were operated by Ontario Hydro, two by MOE's West Central Region and two by the NEMP network. Once again, the percentage of valid data for the entire network was in excess of 90.0. Figure 2 shows the annual frequency distribution of hourly averaged SO_2 concentrations for 1981. Table 3 summarizes the SO_2 annual average concentrations for individual stations. The annual averaged values at all stations for 1981 were well below the 20 ppb criterion. The highest annual average in 1981 was recorded at NNE05 (7ppb).

Seasonal frequency distribution of the hourly SO_2 concentrations is shown in Figure 3. Highest averaged SO_2 concentrations occur during the winter period. Ninety percent of the time the hourly averaged SO_2 values (for the winter period of 1981) did not exceed 30 ppb. During the spring, summer and fall seasons, the ninety percentile coincided with 10 ppb.

Table 4 shows the number of network exceedances of the hourly AQC (250 ppb) for the period 1975 to 1981. There were nineteen hours during 1981 when the hourly AQC was exceeded. Details of the exceedance hours are presented in Table 5. Except for one occasion, monitors showing AQC exceedances were located downwind of the Hydro generating station. On August 26, 1981, an exceedance was recorded at monitor E05 however, winds at the time of exceedance were light (10km/hr) from the east-southeast, making source identification difficult. Stable atmospheric conditions (as indicated by low mixed layer heights) and light and variable winds (70^{o} windshift prior to exceedance hour) contributed to poor dispersion characteristics on this date.

There were no exceedances of the daily AQC (100 ppb) during 1981.

2.2 Analysis of Ozone (O_3) Data:

The annual frequency distribution of the hourly averaged ozone concentrations for SW37, NNE39 and WNW19 is shown in Figure 4. The annual

average ozone concentration was highest at SW37 (31 ppb) and decreased inland, (24 ppb at NNE39). A similar trend was apparent in previous years, Table 6. At monitor SW37, WNW19 and NNE39, the ninety percentile coincided with 55, 50 and 43 ppb respectively.

Seasonal frequency distribution of the hourly O_3 concentrations is shown in Figure 5. Ozone levels are highest in the summer season due to predominant southerly winds, clear skies and strong insolation. Ninety percent of the time during the winter, spring, summer and fall, the ozone concentrations (for the entire network) did not exceed 30, 50, 69 and 39 ppb respectively.

During 1981, there were a total of 341 exceedances of the AQC for ozone (80 ppb). As in previous years, SW37 had the maximum number of exceedances at 159, WNW19 reported 138, and NNE39 reported 44. Exceedances were reported on 35 days during 1981. Thirty of these days were during the growing season (June to September).

2.3 Analysis of Nitrogen Dioxide (NO_2) Data:

Nitric oxide (NO) concentrations were subtracted from total nitrogen oxide (NO_x) values to obtain the hourly NO_2 values. Nitrogen oxides were measured at five locations, (SW37, NNE39, NO7, WNW19 and NNE10). Annual average concentrations were below 14 ppb (Table 7). The maximum hourly concentration (100 ppb) was recorded at NNE10. Annual frequency distribution of the hourly averaged NO_2 concentrations is shown in Figure 6. Ninety percent of the time the NO_2 concentrations did not exceed 20 ppb. There were no exceedances of the one hour (200 ppb) or the 24 hour (100 ppb) AQC during 1981.

2.4 Analysis of Total Reduced Sulfur (TRS) Data:

TRS was monitored at four locations, (NNE10, NNE05, NNW08 and WNW03) during 1981. Annual frequency distribution of the hourly averaged TRS concentrations is shown in Figure 7. As in previous years, the annual average for the TRS network was less than 1 ppb. Concentrations were highest at the Nanticoke Village monitor (WNW03). The ninety-nine percentile for WNW03 coincides with 6 ppb compared with 3,3 and 2 ppb at NNE10, NNE05 and NNW08

respectively. Also, the maximum hourly concentration (36 ppb) was recorded at monitor WNW03, (Table 8). On March 29, 1981, hourly concentrations (18-36 ppb range) were observed for the period 0100 to 0600 EST at WNW03. Surface winds (as monitored by the 10 m level of the Jarvis meteorological tower) were from the southwest at 25 km/hour during this period. Thus Stelco was the likely source of this TRS event.

2.5 Analysis of Carbon Monoxide (CO) Data:

Carbon monoxide monitoring continued at NNE39 and SW37 throughout 1981. Figure 8 shows the yearly frequency distribution of hourly averaged CO concentrations for 1981. Ninety-nine percent of the time the CO concentrations did not exceed 1 ppm (Table 9). The hourly (30 ppm) and eight-hourly (13 ppm) AQC for CO was never exceeded during 1981.

2.6 Analysis of Hydrocarbon Methane CH_4 and Non-Methane MNHC Data:

Figures 9 and 10 show the annual network (NNE10, NNE05 and NNW08) frequency distribution of methane and non-methane hydrocarbons. The annual average concentrations for CH_4 and NMHC are summarized in Table 10 and 11 respectively.

It should be noted here that during the latter part of 1981, non-methane concentrations were observed to increase, especially at NNE10 and NNW08. After intensive investigation and consultation with the manufacturer, it was determined that there was excessive electrical noise which affected the zero calibration of the instrument. So far no cure has been found for this problem. This places some doubt on the validity of the observed values. A longer calibration period (up to 4 hours) is being tried so that the electrical interference is eliminated. If this procedure is successful in eliminating the noise it may be possbile to correct the previous data set.

3.0 Airborne Particulates Data:

The particulate monitoring network in the Nanticoke area during 1981 consisted of 14 hi-vol samplers, operated by NEMP (Figure 11). In January of 1981, the sampler at SW37 was relocated at SW40 to help alleviate the problem of wind blown dust at the former location. Glass fibre filters were used at all locations with parallel sampling on Whatman 41 cellulose filters at eight stations. TSP measurements were carried out on the glass fibre filters while a detailed chemical analysis was done on selected Whatman 41 filters. Some of the glass fibre filters were also analysed for polynuclear aromatic hydrocarbons (PAH) and inorganic (CF) and total carbon (CT). A six day sampling cycle was used at all stations except for the hi-vol samplers at W07, NW03 and NNW06, which operated on a three day cycle to monitor the Stelco emissions. Sampling periods were 24-hours in duration. The chemical analyses results of the selected Whatman 41 filters collected during 1981 for the entire NEMP network are listed in Appendix 1. PAH results and total and free carbon results are also listed by station for 1981 in Appendix 1.

Suspended particulates are summarized by station in Table 12. Annual geometric means were in the 30 to 40 ug/m^3 range. The annual and seasonal frequency distributions of TSP for the entire NEMP network during 1981 are shown in Figures 12 and 13. Monthly geometric means for the NEMP network TSP data (1979-1981) are plotted in Figure 14. The monthly trend in TSP levels has been similar for all three years data. Concentrations are higher during the May to September period compared with the October to April period.

There were no exceedances of the annual AQC (60 ug/m^3) for TSP during 1981 however, there were 10 exceedances of the daily AQC (120 ug/m^3). On May 22, 1981, TSP exceedances were recorded at seven different monitoring locations throughout the NEMP network. The maximum concentration was observed at NW03 (184 ug/m^3). The following monitors also recorded elevated TSP on May 22; N17 (129), W07 (155), NE 27 (121), NE16 (121), NE41 (141) , and NNE22 (124). Surface winds (as measured by the 10 m level of the Jarvis meteorological tower) were from the northwest at 18 km/hour. TSP levels were high throughout the entire West-Central region on this day. A high pressure system, centred over southern Ontario, created a widespread subsidence inversion. Local as well as long range pollution was trapped below the inversion

layer. The remaining three exceedances in 1981 occurred at NNW06. On May 4, the surface winds were from the southerly quadrant making Stelco the probable source. On June 30, agricultural activity adjacent to the sampling station caused the elevated TSP. Finally, on August 26, the surface winds were light and variable making source identification difficult.

Annual and seasonal means for sulfate, nitrate, calcium, magnesium and total carbon levels are shown in Table 13. Data for all three years of network operation (1979, 1980 and 1981) have been included for comparison purposes. Annual means for all five parameters are comparable to those observed in other years. As in previous years, sulfate and total carbon concentrations are highest during the summer season.

During 1981, sulfate, nitrate and total carbon concentrations are higher for southerly versus northerly winds (Table 14).

4.0 Precipitation Data:

The NEMP precipitation network continued throughout 1981 to collect monthly samples at six sites in the Nanticoke region (Figure 15). Precipitation samples are analyzed for pH, major ions, some nutrients and trace metals. Chemical analysis results for all 1981 precipitation samples are listed in Appendix 2.

Network averaged pH, selected major ion and trace metal concentrations are listed in Table 15. For comparison purposes 1979 and 1980 concentrations are also shown.

It may be noted that, with the exception of Zn, there has been little annual variation in the precipitation concentrations. The earlier high values for Zn are now thought to be an artifact, due to sampling and analysis errors. Table 15 also shows "representative" values of all the above parameters for the general MOE West-Central region, which come from data obtained by the Acid Precipitation in Ontario Study (APIOS) (6). Since APIOS sites have been carefully chosen to be representative of "background" conditions (free from local sources of pollution), a comparison of NEMP and APIOS values should indicate whether there is a lcoal impact of industrial activity on the precipitation quality. Generally, there is no indication in the data of any local impact, as can be seen from the last two columns of Table 15.

5.0 Summary:

This report summarizes the 1981 gaseous data collected by the NEMP, Ontario Hydro and MOE West Central Region networks as well as the 1981 particulate and precipitation data collected by the NEMP network.

The hourly (250 ppb) AQC for SO_2 was exceeded 19 times during 1981. There were no exceedances of the daily (100 ppb) AQC for SO_2. The annual average values at all stations for 1981 were less than half of the annual criterion (20 ppb).

The ozone network recorded 341 hourly exceedances of the ozone AQC (80 pb), 159 at SW37, 138 at WNW19 and only 44 at NNE39.

As in previous years, NO_2 and CO levels were well below their respective AQC during 1981.

Annual average TRS concentrations were less than 1 ppb for all four monitors.

The annual average for methane and non-methane hydrocarbon was less than 2 ppm and 1 ppm respectively.

There were 10 TSP exceedances of the daily (120 ug/m^3) AQC during 1981. Seven of these exceedances occurred on the same day (May 22) and were associated with local as well as long range pollution due to a subsidence inversion. Sulfate, nitrate and total carbon concentrations were higher for southery versus northerly winds.

pH for wet deposition in the NEMP network during 1981 was 4.1.

Ambient air quality in the Haldimand-Norfolk Region continued to ber satisfactory throughout 1981.

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Table 1

Emission Estimates (metric tons per year)

	Particulates			Sulfur Dioxide		
	1979	1980	1981	1979	1980	1981
Ontario Hydro	1,500	2,000	2,400	155,000	144,000	181,000
Texaco	300	290	280	8,500	6,800	4,200
Stelco	-	106*	191+	-	185*	335+

* coke ovens not operating
\+ coke ovens operational for only one month

Table 2 Station Location and Description

GEOGRAPHICAL ID	AQUIS ID	E-W UTM#	N-S UTM#	SITE NAME	INSTRUMENT, COMPLIMENT AND NOTES	MAINTAINED BY
SW17	22901	05502	47138	LONG POINT PARK	SO2 (PHILIPS) O3 (BENDIX) NOX (TECO) CO (BENDIX) AUTO AEM (OCA) Coll (RAC)	NEMP CONTRACTOR
SW40	22959	05454	47152	BIG CREEK	PRECIP GAUGE (F/P) PRECIP COLLECTOR (SANDAMO) TSP HIVOL (GEN. MET) COMP HIVOL (GEN. MET.)	NEMP CONTRACTOR
W07	22953	05702	47396	DOOS WEST EAST	TSP HIVOL (GEN. MET.) COMP. HI-VOL (GEN. MET.) PRECIP COLLECTOR (SANDAMO) PRECIP GAUGE (F/P)	NEMP CONTRACTOR
W13	22861				SO2 (PHILIPS) DATA RECORDER WEST)	HYDRO CTS/NOS
	-----	05641	47383	PORT DOVER	----------	
	22056				TSP HI-VOL (GEN. MET.)	MOE/WCR
WNW03	22871	05752	47398	NANTICOKE VILLAGE	SO2 (PHILIPS) DATA RECORDER (WEST) TRS (PHILIPS)	HYDRO CTS/NOS NEMP CONTRACTOR
WNW19	22071	05597	47449	SIMCOE HORTICUL-TURAL	SO2 (TECO) O3 (BENDIX) NOX (TECO) COH (RAC)	MOE/WCR
WNW20	22872	05596	47485	BLOOMSBURG	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO) CTS/NOS
NW03	22961	05758	47412	NANTICOKE NORTH	TSP HI-VOL (GEN. MET.) COMP. HI-VOL (GEN. MET.)	NEMP CONTRACTOR
	22881				SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CTS/NOS
NNW08	-----	05744	47456	NANTICOKE ROAD	----------	
	22905				TRS (PHILIPS) MC (BYRON)	NEMP CONTRACTOR
	22882				SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CTS/NOS
NNW11	-----	05712	47478	JARVIS	----------	
	22032				TSP HI-VOL (GEN. MET.)	MOE/WCR
NNW12	22883	05744	47497	JARVIS MET. TOWER	10 m WIND SPEED/DIR (BENDIX) 10 m TEMPERATURE (ROSEMONT) 30 m WIND SPEED/DIR (BENDIX) 85 m WIND SPEED/DIR (BENDIX) 85 m TEMPERATURE (ROSEMONT) 4 DATA RECORDERS (WEST)	HYDRO CTS/NOS
NNW15	22884	05717	47522	LIVINGSTON	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CTS/NOS

Table 2 con't Station Location and Description

GEOGRAPHICAL ID	AQUIS ID	E-W UTM#	N-S UTM#	SITE NAME	INSTRUMENT, COMPLIMENT AND NOTES	MAINTAINED BY
HHW18	22954	05654	47535	VILLA NOVA	TSP HI-VOL (GEN. MET.) PRECIP COLLECTOR (SANGAMO)	NEMP CONTRACTOR
HNW06	22963			STELCO NORTH	TSP HI-VOL(GEN. MET.) COMP HI-VOL (GEN. MET.)	NEMP CONTRACTOR
H07	22811 --- 22906 --- 22069	05787	47458	SANDUSK	SO2 (PHILIPS) DATA RECORDER (WEST) --- NOX (TECO) --- TSP HI-VOL (GEN. MET.)	HYDRO CIS/NOS NEMP CONTRACTOR MOE/WCR
H15	22812	05774	47535	GARNET	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CIS/NOS
H17	22951	05768	47548	HAGERSVILLE SOUTH	TSP HI-VOL (GEN. MET.) COMP. HI-VOL (GEN. MET.)	NEMP CONTRACTOR
HNE05	22921 ----- 22904	05794	47434	WALPOLE SOUTH	SO2 (PHILIPS) DATA RECORDER (WEST) --- TRS (PHILIPS) HC (BYRON) TSP HI-VOL (GEN. MET.) COMP. HI-VOL (GEN. MET.)	HYDRO CIS/NOS NEMP CONTRACTORS
HNE09	22822	05830	47463	DRY CREEK	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CIS/NOS
HNE10	22886	05821	47472	CHEAPSIDE	SO2 (TECO) NOX (TECO) COLL (RAC) TSP HI-VOL	MOE/WCR
HNE10	22903	05821	47472	CHEAPSIDE	TRS (PHILIPS) HC (BYRON) AUTO APM (OCA)	NEMP CONTRACTOR
HNE16	22823	05872	47518	BALMORAL	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CIS/NOS
HNE20	22825	05880	47561	DECEWSVILLE	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CIS/NOS
HNE22	22960	05839	47600	DUFFERIN NORTH	TSP HI-VOL PRECIP COLLECTOR (SANGAMO)	NEMP CONTRACTOR
HNE39	22902	05914	47746	PINBROOK WEST	SO2 (PHILIPS) O3 (DENDIX) NOX (TECO) CO (DENDIX) TSP HI-VOL (GEN. MET.) COLL (RAC)	NEMP CONTRACTOR

NOX (TECO)
CO (RENRIX)
TSP HI-VOL (GEN. MET.) NEMP CONTRACTOR
COLL (RAC)
[illegible]

Table 2 con't Station Location and Description

GEOGRAPHICAL ID	AQUIS ID	E-W UTM	N-S UTM	SITE NAME	INSTRUMENT, COMPLIMENT AND NOTES	MAINTAINED BY
NE07	22962	05018	47443	DRY CREEK WEST	ACOUSTIC SOUNDER	NEMP CONTRACTOR
NE16	22957	05886	47509	FISHERVILLE NORTH	TSP HI-VOL(GEN. MET.) COMP. HI-VOL (GEN. MET.)	NEMP CONTRACTOR
NE19	22032	05935	47489	KOHLER ROAD	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CTS/NOS
NE27	22956	06026	47527	CANFIELD SOUTH	TSP HI-VOL (GEN. MET.) PRECIP COLLECTOR (SANDAMO) PRECIP GAUGE (F/F)	NEMP CONTRACTOR
NE41	22958	06109	47607	CANBORO EAST	TSP HI-VOL (GEN. MET.) PRECIP COLLECTOR (SANDAMO)	NEMP CONTRACTOR
ENE11	22041 ----- 22031	05870	47434	SELKIRK	SO2 (PHILIPS) DATA RECORDER (WEST) --- TSP HI-VOL (GEN. MET.)	HYDRO CTS/NOS --- MOE/WCR
ENE17	22955	05934	47441	RAINHAM CENTRE SOUTH	TSP HI-VOL (GEN. MET.) COMP. HI-VOL (GEN. MET.)	NEMP CONTRACTOR
ENE18	22842	05950	47445	RAINHAM CENTRE	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CTS/NOS
E04	22952	05822	47388	PEACOCK POINT PARK	TSP HI-VOL (GEN. MET.) COMP HI-VOL (GEN. MET.)	NEMP CONTRACTOR
E05	22851	05831	47380	PEACOCK POINT	SO2 (PHILIPS) DATA RECORDER (WEST)	HYDRO CTS/NOS

Table 3

Data Summary by Station for SO2 Network -- 1981

STATION ID	ARITHEMETIC MEAN	MAXIMUM	CONCENTRATION (PPB) NOT EXCEEDED DURING GIVEN % OF HOURS				# MONITORING HOURS	% OF VALID DATA	NUMBER OF EXCEEDANCES	DAILY MAX
			10%	50%	90%	99%				
N07	4	449	0	0	10	47	8760	93.58	3	53
N15	4	325	0	1	10	42	8760	96.53	1	47
NNE05	7	308	0	3	17	57	8760	89.67	2	55
NNE09	5	1131	0	1	13	55	8760	93.85	4	60
NNE16	6	415	0	2	15	63	8760	93.48	1	62
NNE20	5	171	0	1	12	52	8760	89.11	0	51
NE19	5	150	0	2	14	51	8760	92.91	0	52
ENE11	4	190	0	1	11	43	8760	88.30	0	50
ENE18	5	90	0	2	12	40	8760	92.04	0	45
E05	4	257	0	0	12	41	8760	85.81	1	57
W13	4	105	0	0	10	42	8760	95.35	0	56
WNW03	4	142	0	0	10	44	8760	96.51	0	52
WNW20	4	241	0	0	11	40	8760	59.98	0	37
NNW08	4	296	0	1	11	46	8760	86.58	2	49
NNW11	4	223	0	1	11	44	8760	84.04	0	45
NNW15	5	231	0	1	11	47	8760	92.96	0	49
SW37	6	197	0	3	13	46	7547	91.02	0	61
NNE39	6	301	0	3	14	50	7871	94.66	1	44
WNW19	4	210	0	0	10	40	8661	94.03	0	39
NNE10	5	300	0	0	10	50	8617	94.82	4	49

Concentrations are in ppb
Hourly AQC for SO2 is 250 ppb
Daily AQC for SO2 is 100 ppb

Table 4

Exceedances of the Hourly SO2 AQC by Station - 1975 to 1981

Station	1975	1976	1977	1978	1979	1980	1981
N07	1	3		2	2		3
N15						1	1
NNE05	-	-	-			2	2
NNE09	4	4	3	6	1	1	4
NNE16	4	4	1	2	1	2	1
NNE17	1		3	-	-	-	-
NNE20	-	-	-			1	
NE10	1	1			-	-	-
NE19							
ENE11							
ENE18							
E05					1		1
W13				1			
WNW03					1		
WNW20		2					
NNW08		3	3	2	1		2
NNW11		1	1		1		
NNW15		2	1	1			
SW37	-	-	-				
NNE39	-	-	-				1
WNW19							
NNE10				6	3	1	4
	11	20	12	20	11	8	19

- monitor not in operation
Hourly AQC for SO2 is 250 ppb

Table 5

Details of Exceedance Events for 1981

Date	Time (EST)	Monitor	Average SO2 (ppb)	Wind Speed (km/hr)	Wind Dir	Stati Loa (mw
April 10	1600	NNE16	315	25	SSW	220
May 4	1600	NNE10	280	11	S	199
May 8	1200	NNW08	266	17	S	245
July 3	1400	N07	265	15	SSW	186
	1500	N07	449	12	SSW	169
August 22	1300	NNE05	294	10	S	87
August 26	2200	E05	257	10	ESE	201
October 14	1100	NNE10	300	18	SSW	226
	1200	NNE39	301	16	SSW	219
October 20	1000	NNE09	320	41	SSW	273
	1100	NNE09	321	45	SSW	265
	1300	NNE10	280	43	SSW	265
October 24	1400	NNE10	280	13	SSW	172
October 25	1500	N07	255	11	SSE	179
November 10	1200	NNW08	296	12	S	308
	1400	N15	325	14	S	308
November 26	2400	NNE05	308	50	SSW	226
November 27	0200	NNE09	1131	54	SW	134
	0300	NNE09	323	58	WSW	110

Hourly AQC for SO2 is 250 ppb
Wind data is from the 85 m level of Jarvis meteorological tower

Table 6

Ozone (O3) Data Summary by Station - 1979 to 1981

Station Id	Year	Conc (ppb) not exceeded during given % of hours 10%	50%	90%	99%	Maximum conc	Annual avg	% Valid Data	# Monitoring Hours	# Exceedances of AQC
	1979	13	27	53	89	140	30	67.5	5917	86
SW37	1980	13	29	60	95	123	33	87.4	7678	225
	1981	12	28	55	90	129	31	91.9	8323	159
	1979	9	25	46	75	118	27	82.4	6010	34
NNE39	1980	7	22	41	69	102	24	74.0	6496	15
	1981	6	23	43	75	103	24	96.2	8627	44
	1979	9	26	50	82	148	28	95.8	8394	96
WNW19	1980	9	24	46	75	79	26	93.0	8169	45
	1981	10	26	50	89	111	29	96.2	8627	138

Values are in ppb
Hourly AQC for O3 is 80 ppb

Table 7

Nitrogen Dioxide (NO2) Data Summary by Station - 1979 - 1981

Station Id	Year	Conc (ppb) not exceeded during given % of hours 10%	50%	90%	99%	Maximum conc	Annual avg	% Valid Data	# Monitoring Hours	# Exceedances of AQC
	1979	2	7	21	44	79	10	78.3	5543	0
SW37	1980	2	6	14	25	52	7	67.9	6509	0
	1981	2	6	15	31	58	7	N/A	7569	0
	1979	2	8	23	47	83	11	93.8	8338	0
NNE39	1980	2	7	21	38	63	10	98.9	7284	0
	1981	1	7	21	47	74	10	N/A	6344	0
	1979	1	7	18	30	57	8	96.9	4840	0
NO7	1980	2	8	17	30	57	9	58.4	7248	0
	1981	1	6	17	33	66	8	N/A	4930	0
	1979	0	10	20	50	130	13	97.3	8375	0
NNE10	1980	0	10	20	40	60	8	97.8	7745	0
	1981	0	10	20	40	100	10	98.9	8760	0
	1979	0	10	20	40	80	10	98.7	8686	0
WNW19	1980	0	10	20	40	90	12	96.3	8763	0
	1981	0	10	20	40	90	14	92.0	6685	0

Values are in ppb
Hourly AQC for NO2 is 200 ppb

Table 8

Total Reduced SULPHUR (TRS) Data Summary by Station - 1979 - 1981

Station Id	Year	Conc (ppb) not exceeded during given % of hours 10%	50%	90%	99%	Maximum conc	Annual avg	% Valid Data	# Monitoring Hours
	1979	0	0	1	3	25	0.4	69.2	5030
NNE10	1980	0	0	2	3	14	0.5	76.0	3886
	1981	0	0	2	3	7	0.4	92.3	4791
	1979	0	0	1	3	60	0.4	74.3	5955
NNE05	1980	0	0	1	3	9	0.3	67.9	4462
	1981	0	0	1	3	30	0.3	95.1	7801
	1979	0	0	1	3	8	0.3	49.2	3952
NNW06	1980	0	0	1	3	34	0.3	71.3	5733
	1981	0	0	1	2	7	0.3	97.2	7618
	1979	N/O	N/O	N/O	N/O	N/O	N/O	N/O	N/O
WNW03	1980	0	0	2	5	11	0.8	61.4	899
	1981	0	0	2	6	36	0.6	97.2	7714

Values are in ppb
N/O Not Operating

Table 9

Carbon Monoxide (CO) Data Summary by Station - 1979 - 1981

Station Id	Year	Conc (ppb) not exceeded during given % of hours 10%	50%	90%	99%	Maximum conc	Annual avg	% Valid Data	# Monitoring Hours	# Exceedance of AQC
	1979	0	0	0	1	6	0.1	90.5	6584	0
SW37	1980	0	0	0	1	2	0.1	90.7	7971	0
	1981	0	0	1	1	2	0.2	94.7	8427	0
	1979	0	0	1	1	4	0.1	88.4	7089	0
NNE39	1980	0	0	0	1	3	0.1	88.7	7176	0
	1981	0	0	0	1	2	0.1	98.9	8713	0

Values are in ppm
Hourly AQC for CO is 30 ppm

Table 10

Methane (CH4) Data Summary by Station - 1979-1981

Station Id	Year	Conc (ppb) not exceeded during given % of hours				Maximum conc	Annual avg	% Valid Data	# Monitoring Hours
		10%	50%	90%	99%				
	1979	14	16	28	41	46	18	55.2	4057
NNE10	1980	13	14	16	18	28	14	78.3	6921
	1981	13	15	16	19	25	15	91.1	8352
	1979	11	14	18	39	88	15	81.9	6012
NNE05	1980	12	13	15	29	59	14	81.0	7118
	1981	12	14	16	21	55	14	98.2	7937
	1979	16	19	22	26	34	19	76.8	2820
NNW08	1980	12	15	17	21	32	15	78.3	6874
	1981	13	15	17	22	39	15	92.9	8258

Values are in .1 ppm

Table 11

Non-Methane Hydrocarbon Data Summary by Station - 1979-1981

Station Id	Year	Conc (ppb) not exceeded during given % of hours				Maximum conc	Annual avg	% Valid Data	# Monitoring Hours
		10%	50%	90%	99%				
	1979	0	2	37	140	180	12	57.2	3776
NNE10	1980	1	3	6	9	125	4	74.2	6521
	1981	2	7	10	14	36	7	89.9	8224
	1979	4	6	11	16	38	7	81.0	5948
NNE05	1980	2	5	9	14	77	6	77.8	6832
	1981	3	5	8	11	31	5	97.1	7998
	1979	4	6	8	14	51	6	76.8	2819
NNW08	1980	4	7	9	11	18	7	76.4	6710
	1981	6	8	10	12	19	8	95.8	8253

Values are in .1 ppm

Table 12

Total Suspended Particulate (Tsp) Data Summary by Station - 1981

STATION ID	GEOMETRIC MEAN	MAXIMUN	CONCENTRATION NOT EXCEEDED DURING GIVEN % OF HOURS 10%	50%	90%	99%	STANDARD DEVIATION	# SAMPLES	EXCEEDANCE OF AQC
NNE39	35	88	15	38	67	78	1.9	53	0
NNE05	36	91	17	37	68	73	1.6	47	0
N17	39	129	20	41	67	87	1.6	60	1
E04	33	104	16	33	59	89	1.6	55	0
W07	32	155	14	33	66	97	1.7	118	1
NNW18	34	119	16	33	66	96	1.6	59	0
ENE17	33	68	16	36	59	61	1.6	56	0
NE27	38	121	21	38	66	80	1.5	61	1
NE16	39	121	18	41	73	90	1.6	60	1
NE41	37	141	17	39	71	97	1.7	54	1
SW40	34	97	14	36	68	92	1.7	58	0
NNE22	35	124	15	39	68	76	1.7	58	1
NW03	36	184	17	38	78	109	1.8	108	1
NNW06	36	331	15	40	79	140	1.9	115	3

Concentrations are in ug/m3
Daily AQC for Tsp is 120 ug/m3
Annual AQC for Tsp is 60 ug/m3

Table 13

Annual and Seasonal Distribution of Particulates

		SO4	NO3	Ca	Mg	CT
Winter	1979	3.2 (13)	4.0 (13)	0.78 (15)	0.17 (16)	2.7 (18)
	1980	5.4 (48)	3.8 (48)	0.62 (48)	0.22 (48)	3.9 (40)
	1981	6.1 (46)	3.8 (45)	0.73 (46)	0.19 (46)	4.3 (52)
Spring	1979	4.5 (28)	2.8 (28)	0.76 (24)	0.20 (24)	3.1 (23)
	1980	4.7 (40)	3.1 (40)	1.11 (40)	0.32 (40)	3.7 (42)
	1981	5.0 (47)	3.2 (47)	1.56 (47)	0.47 (47)	5.0 (51)
Summer	1979	7.2 (65)	1.3 (62)	0.78 (62)	0.15 (46)	6.4 (43)
	1980	7.5 (34)	2.5 (34)	0.86 (33)	0.19 (33)	6.7 (37
	1981	8.9 (50)	2.0 (50)	0.81 (50)	0.24 (50)	5.9 (50)
Fall	1979	4.7 (62)	2.4 (62)	0.43 (62)	0.25 (62)	4.3 (57)
	1980	3.0 (29)	2.5 (29)	0.94 (27)	0.19 (27)	3.8 (29)
	1981	4.7 (43)	2.9 (43)	0.96 (43)	0.30 (43)	4.9 (44)
Annual	1979	5.3	2.1	0.53	0.21	4.5
	1980	4.6	2.2	0.83	0.22	4.4
	1981	5.7	2.8	0.99	0.29	4.7

concentrations are in ug/m3
bracketed values indicate number of cases considered
values are expressed as geometric means
CT IS Total Carbon

Table 14

Distribution of Particulates According to Wind Direction

Parameter	Southerly Wind	Northerly Wind
SO4	6.7 (114)	4.5 (73)
NO3	3.2 (113)	2.7 (73)
Ca	0.98 (114)	0.99 (73)
Mg	0.27 (114)	0.32 (73)
CT	5.5 (119)	3.8 (78)

concentrations are in ug/m3
bracketed values indicate number of cases considered
values expressed are geometric means

Table 15

Nemp Network Precipitation Data - 1979 to 1981

Parameter	1979 mean	1980 mean	1981 mean	Representative of MOE/WCR Area *
pH	4.0 (51)	4.1 (69)	4.1 (66)	4.1-4.2
SO4	5.8 (62)	4.9 (71)	5.2 (65)	4.0-4.5
N-NO3	0.83 (67)	0.65 (71)	0.67 (65)	~0.6
Ca	0.71 (67)	0.54 (71)	0.45 (65)	~0.4
Mg	0.19 (67)	0.14 (72)	0.10 (65)	~0.1
K	0.12 (69)	0.08 (72)	0.06 (64)	0.04-0.06
Fe	0.07 (70)	0.05 (65)	0.07 (64)	~0.06
Zn	0.09 (66)	0.10 (65)	0.01 (64)	~0.01

concentrations are in mg/l
( ) number of samples
mean - volume weighted average
pH was converted to HF ion concentration, averaged, then converted back to pH.
* Based on 1981 Acidic Precipitation in Ontario Study Results

FIGURE 1

MONITORING STATIONS IN NANTICOKE REGION

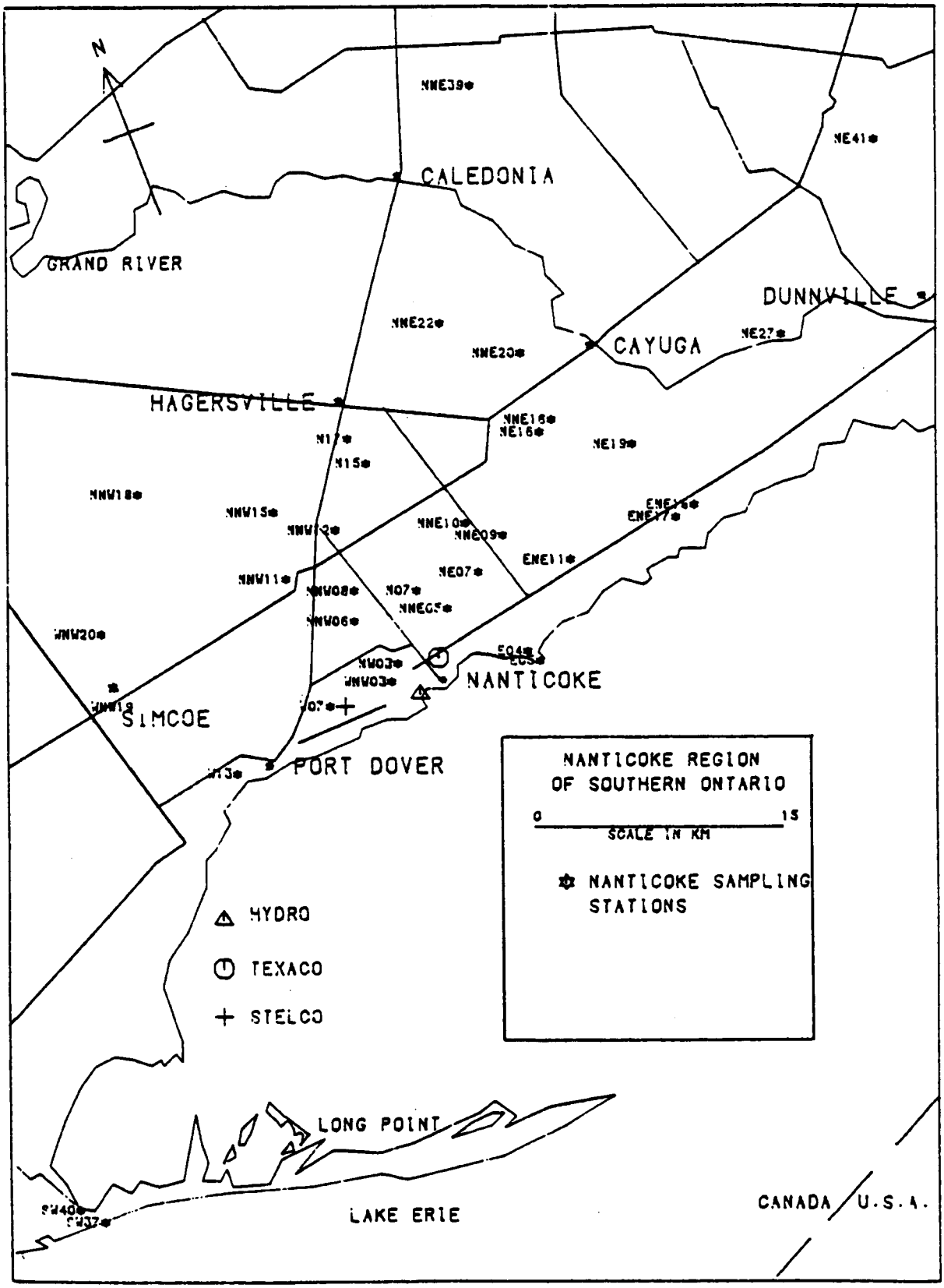


Figure 2

Annual Frequency Distribution of SO2 for 1981

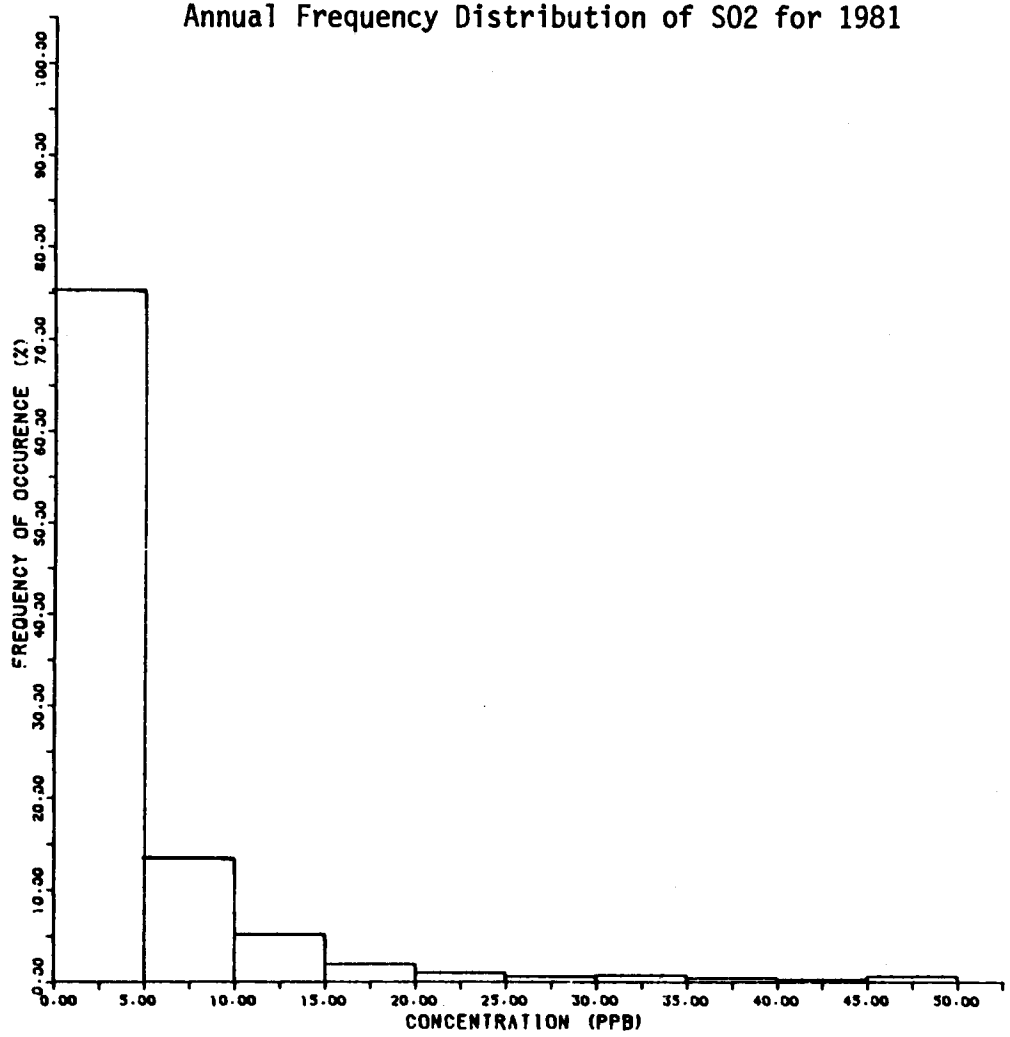
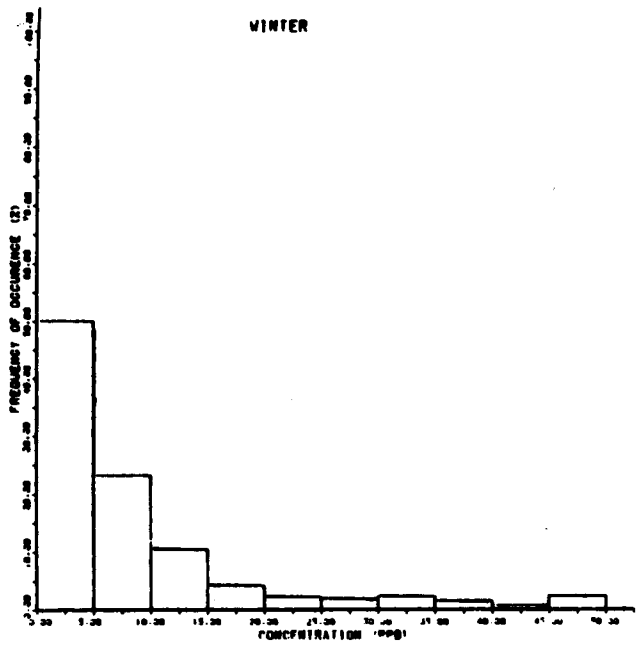
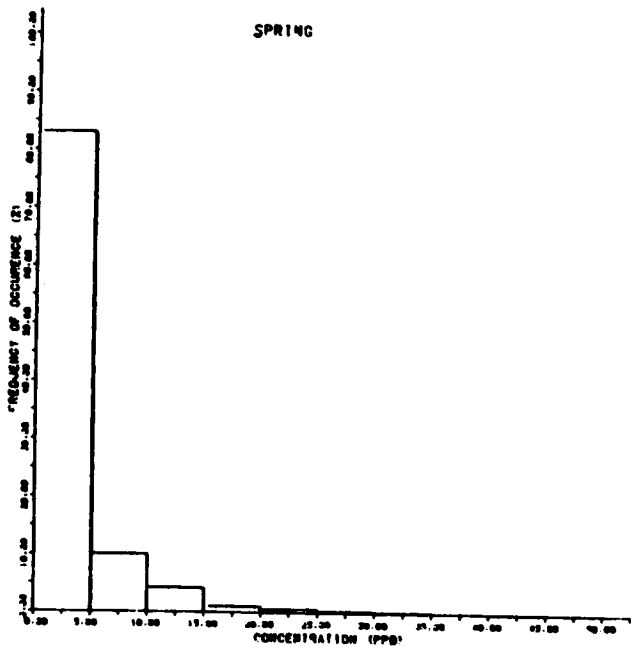
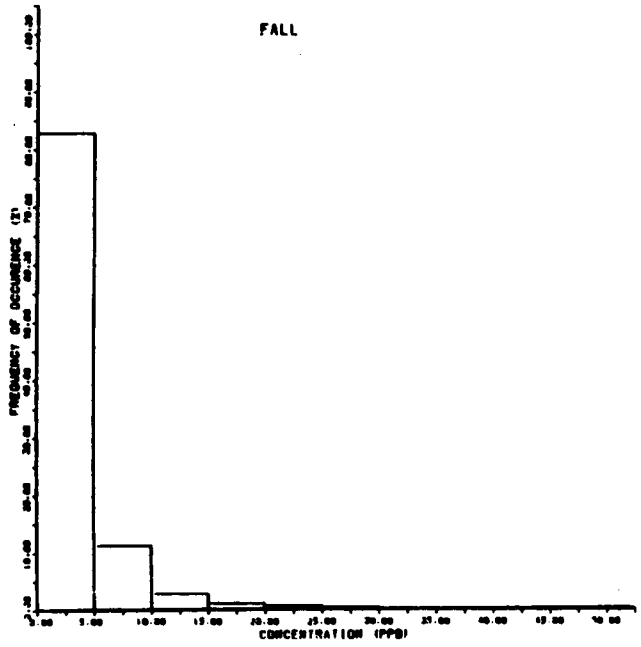


Figure 3 Seasonal Frequency Distribution of SO2 for 1981







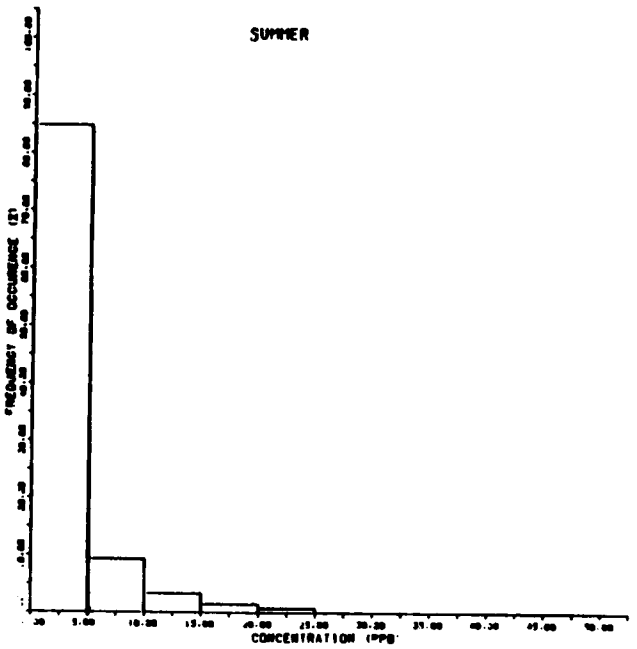


Figure 4

Annual Frequency Distribution of 03 for 1981

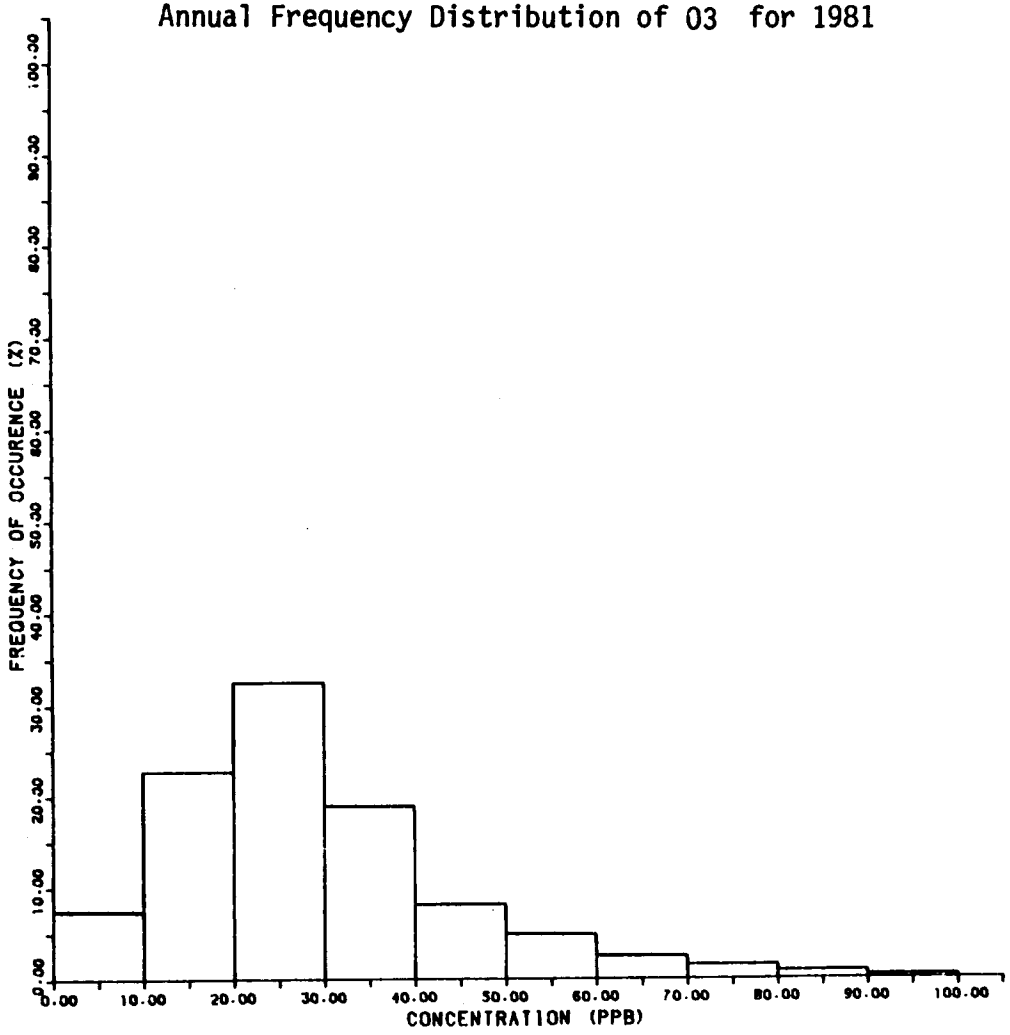
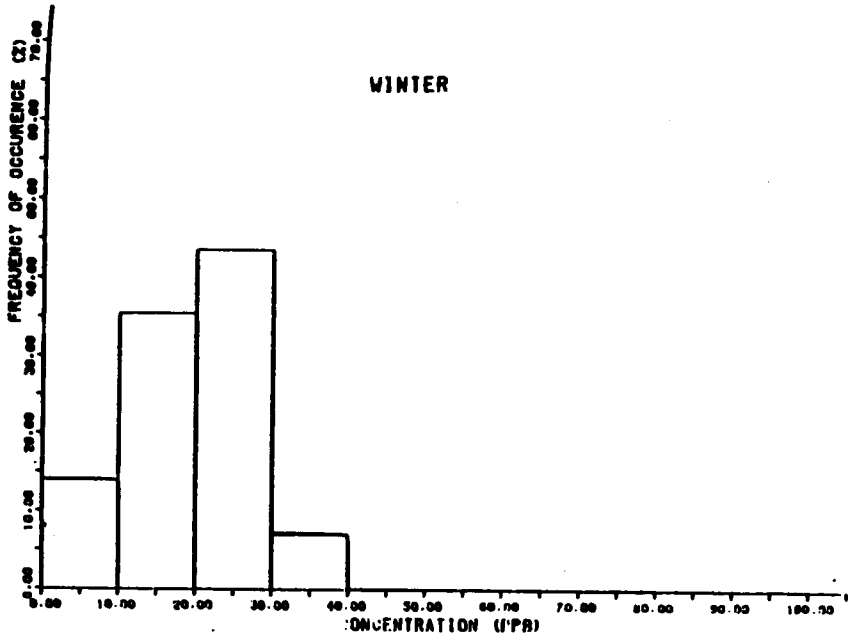
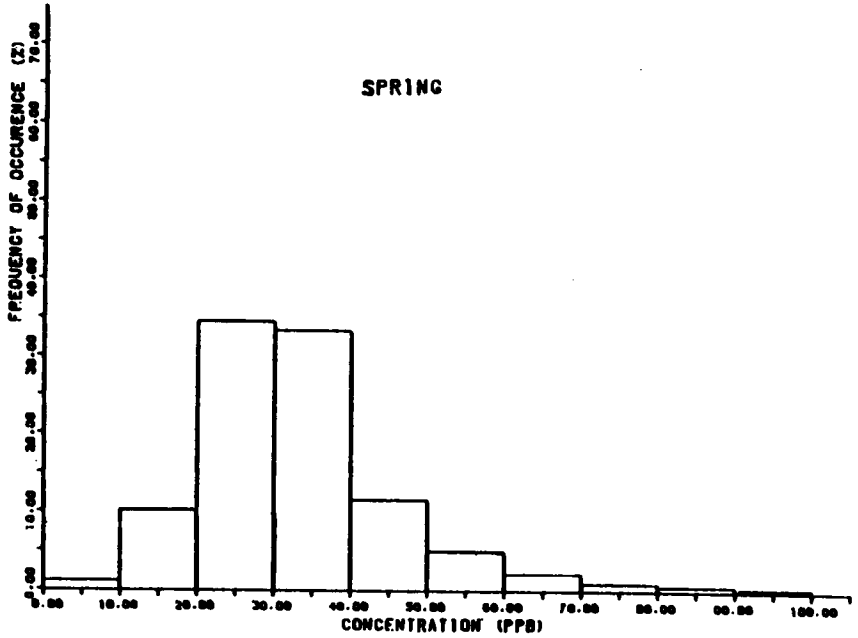
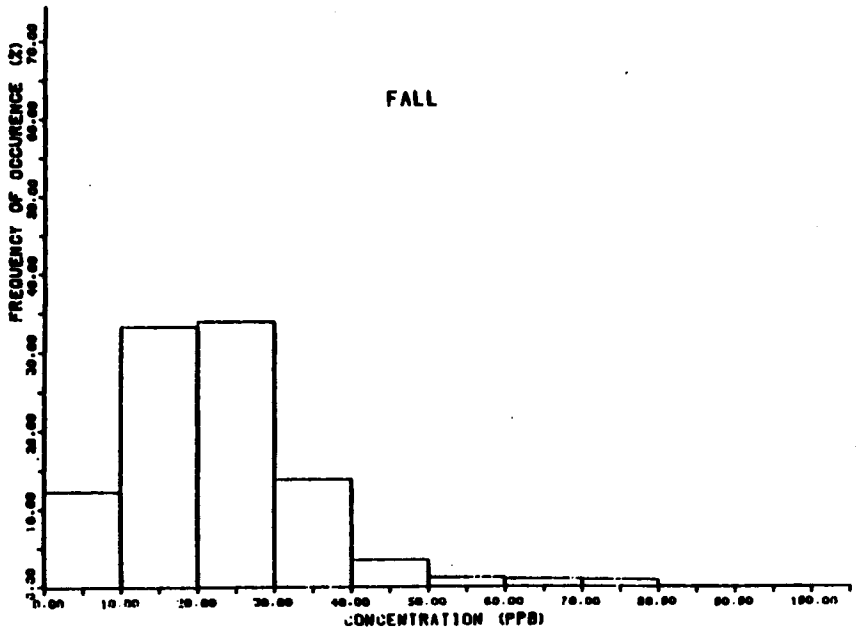


Figure 5 Seasonal Frequency Distribution of 03 for 1981







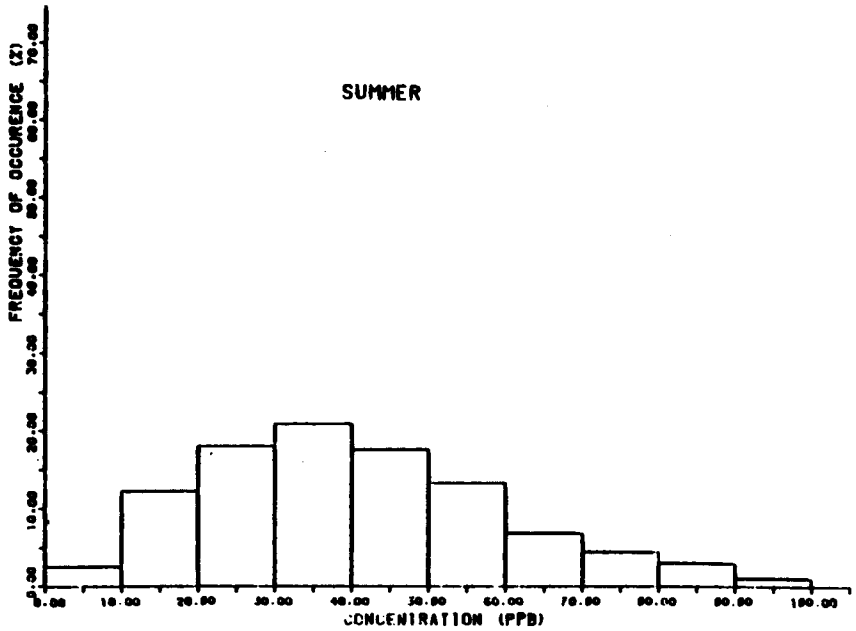


Figure 6

Annual Frequency Distribution of NO2 for 1981

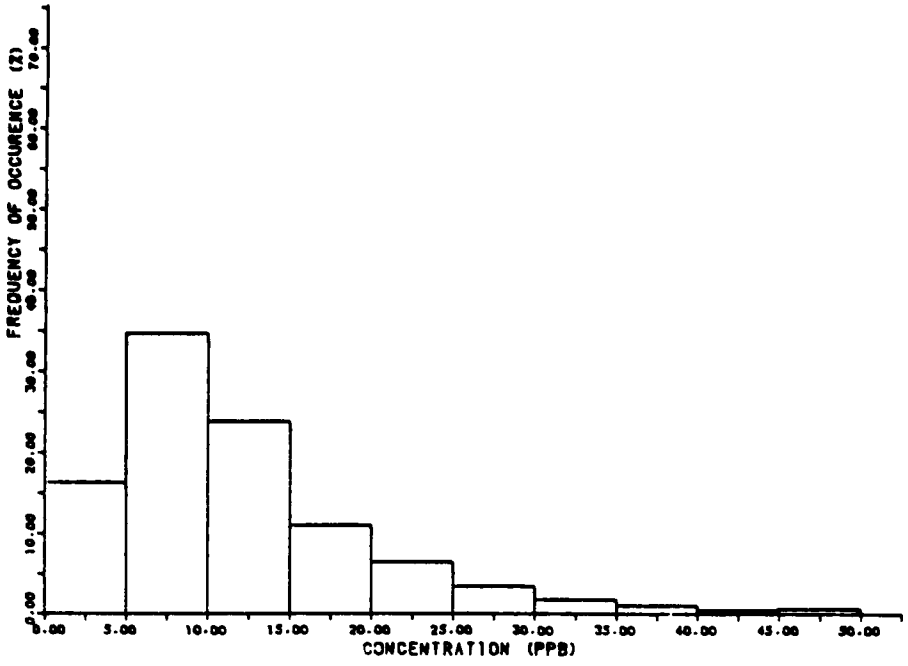


Figure 7

Annual Frequency Distribution of TRS for 1981

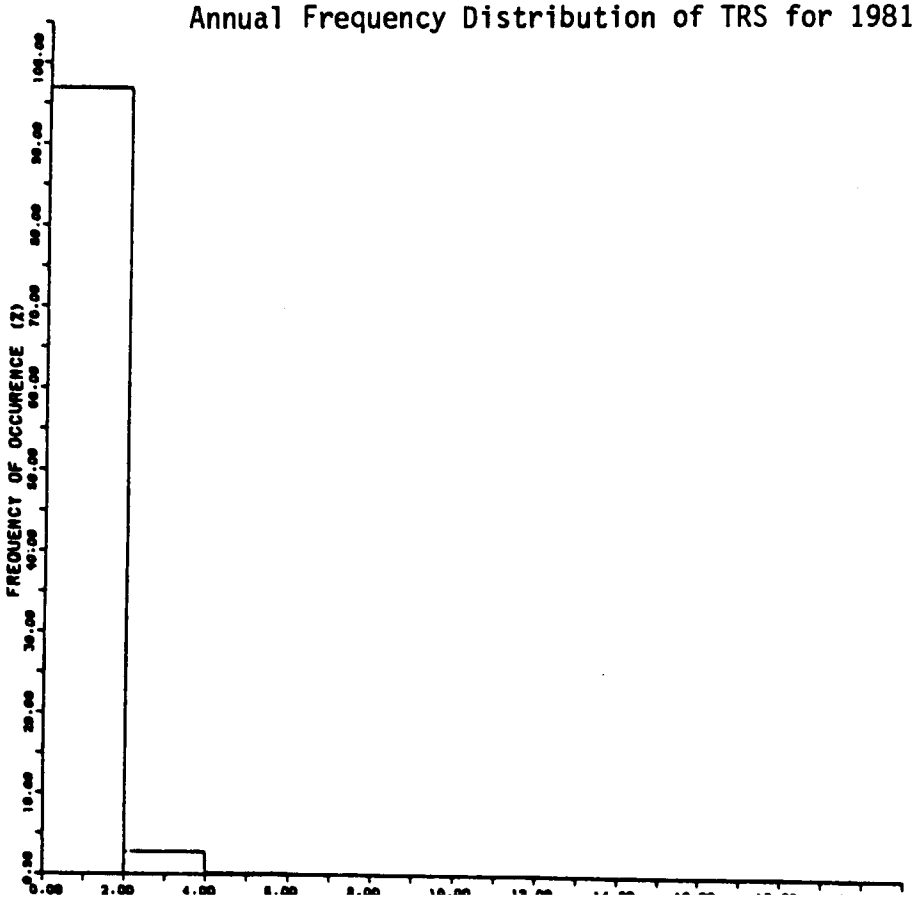


Figure 8

Annual Frequency Distribution of CO for 1981

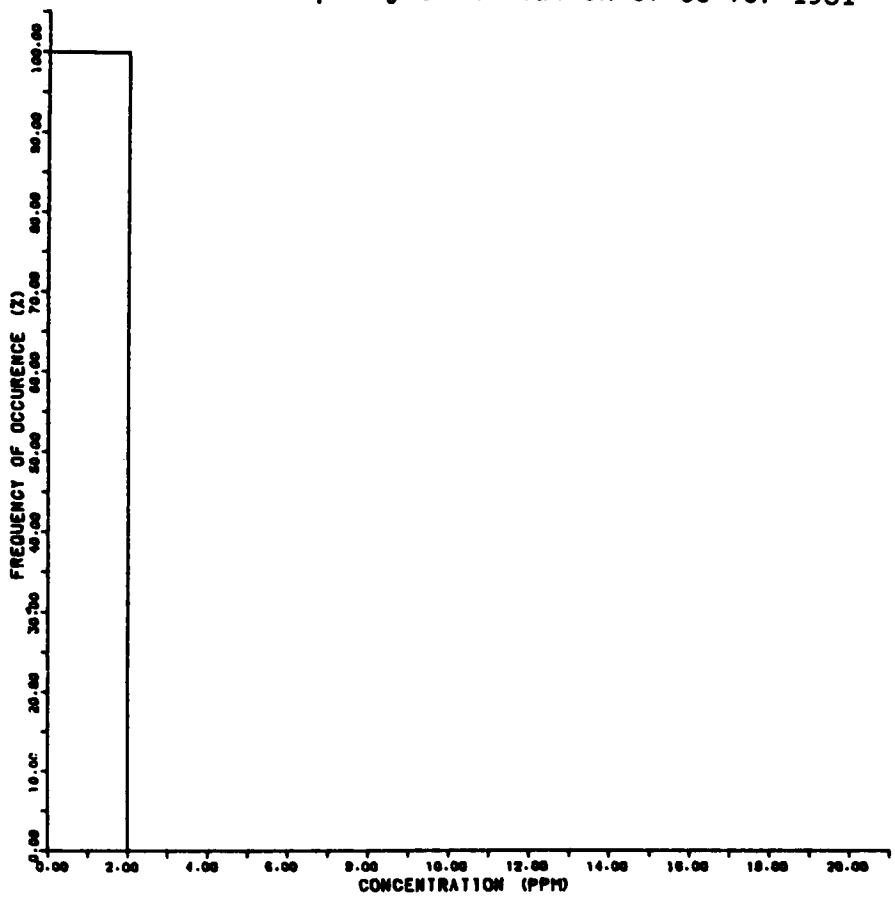


Figure 9

Annual Frequency Distribution of CH4 for 1981

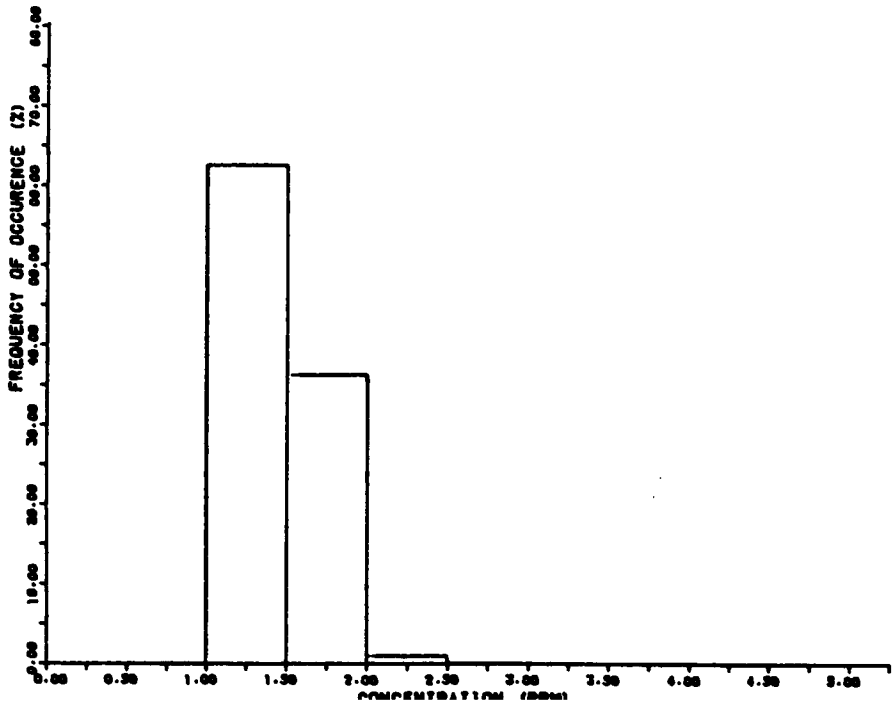


Figure 10

Annual Frequency distribution of NMHC for 1981

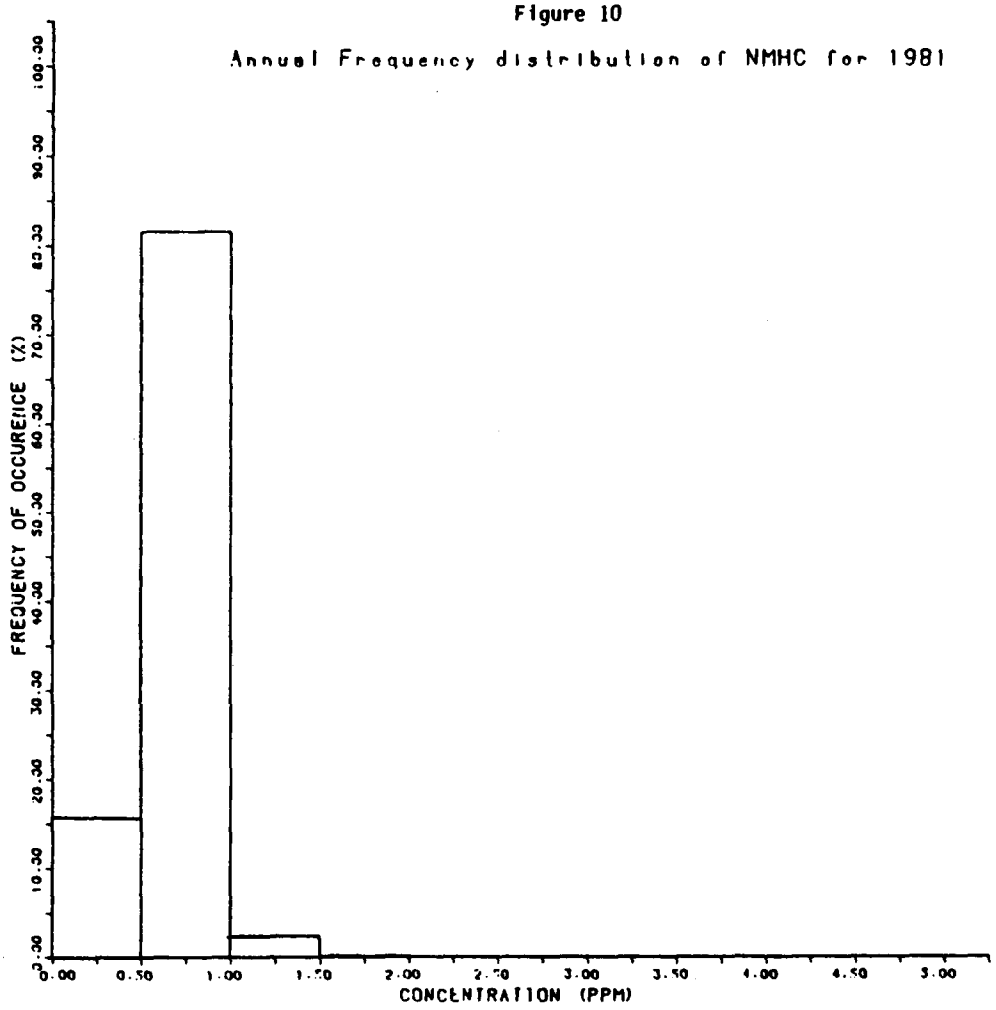


FIGURE 11

HI-VOL SAMPLING NETWORK

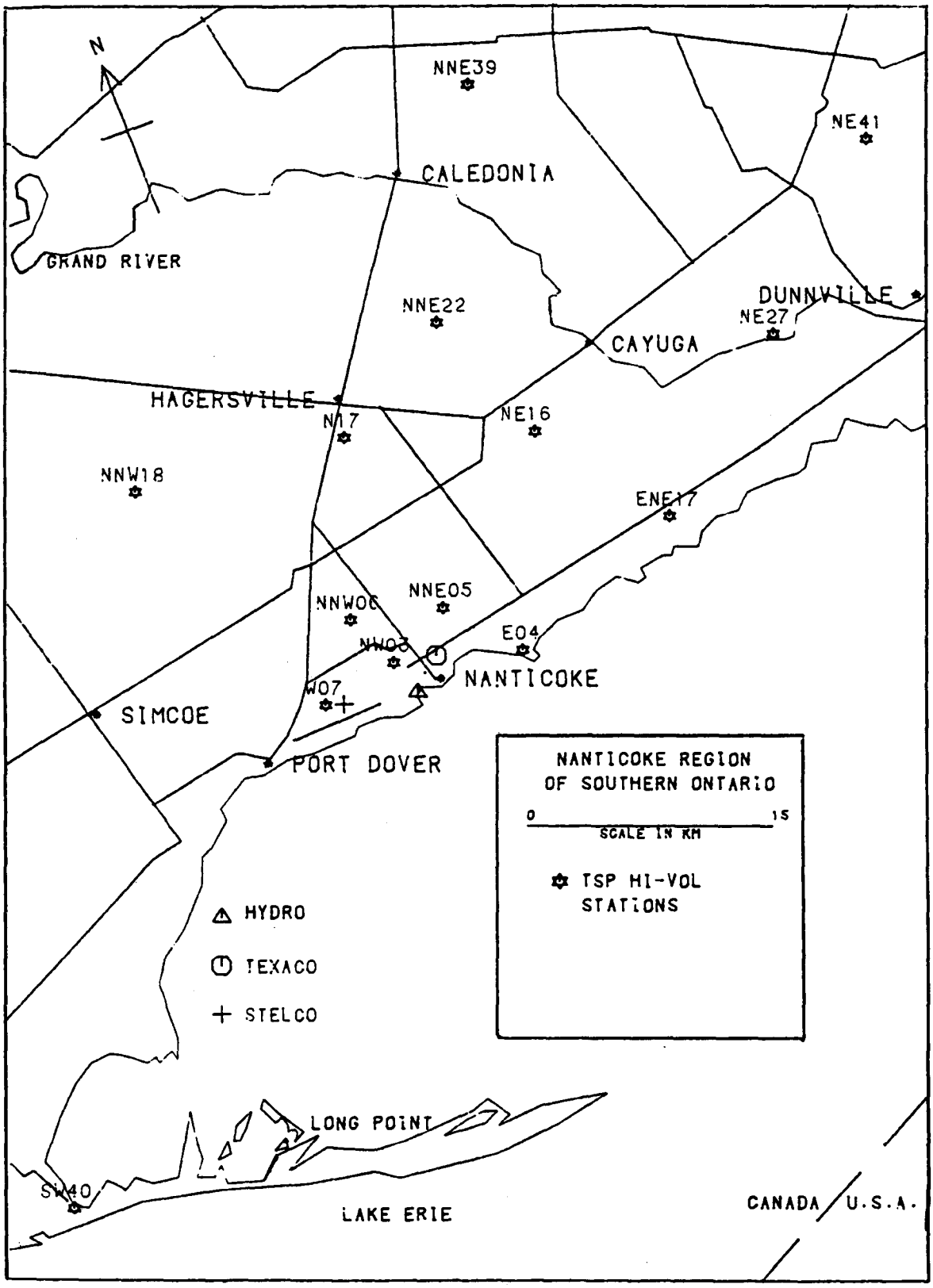


Figure 12
Annual Frequency Distribution of Tsp for 1981

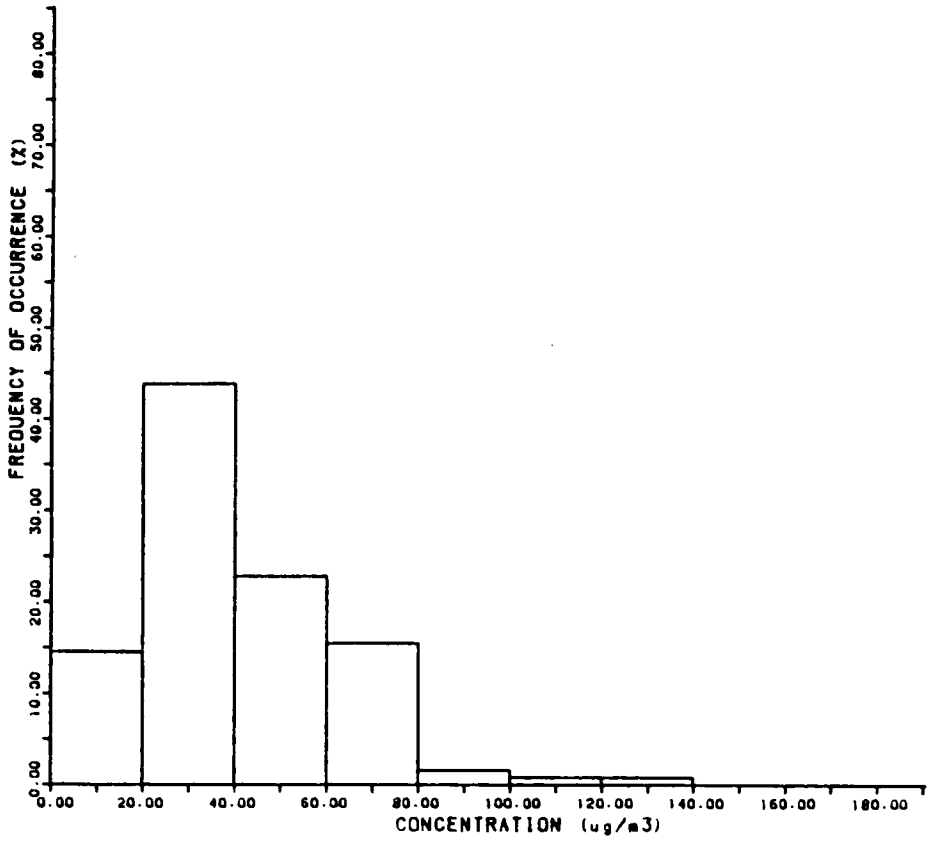
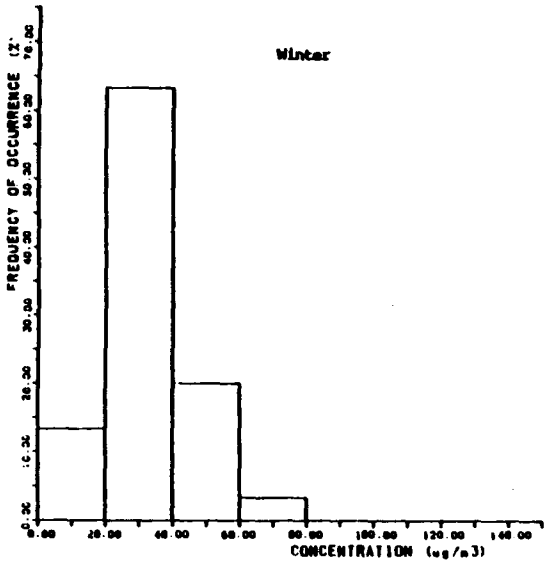
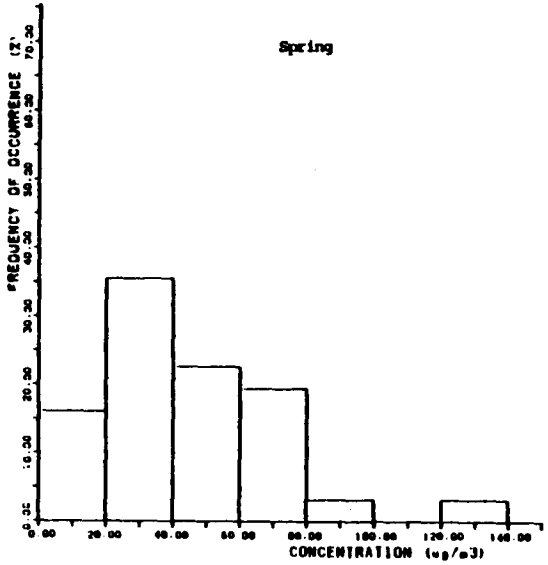
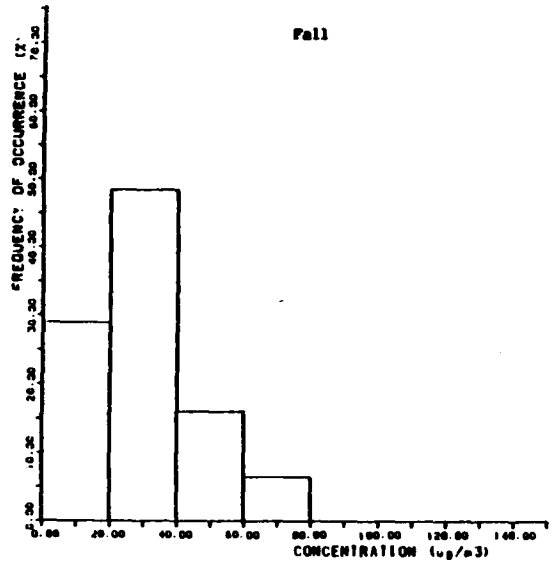


Figure 13 : Seasonal Frequency Distribution of Tsp for 1981







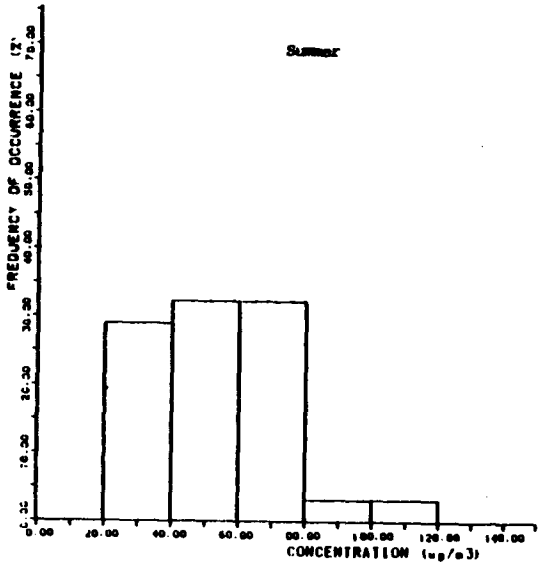


Figure 14

NEMP NETWORK TSP-
MEAN MONTHLY CONCENTRATIONS

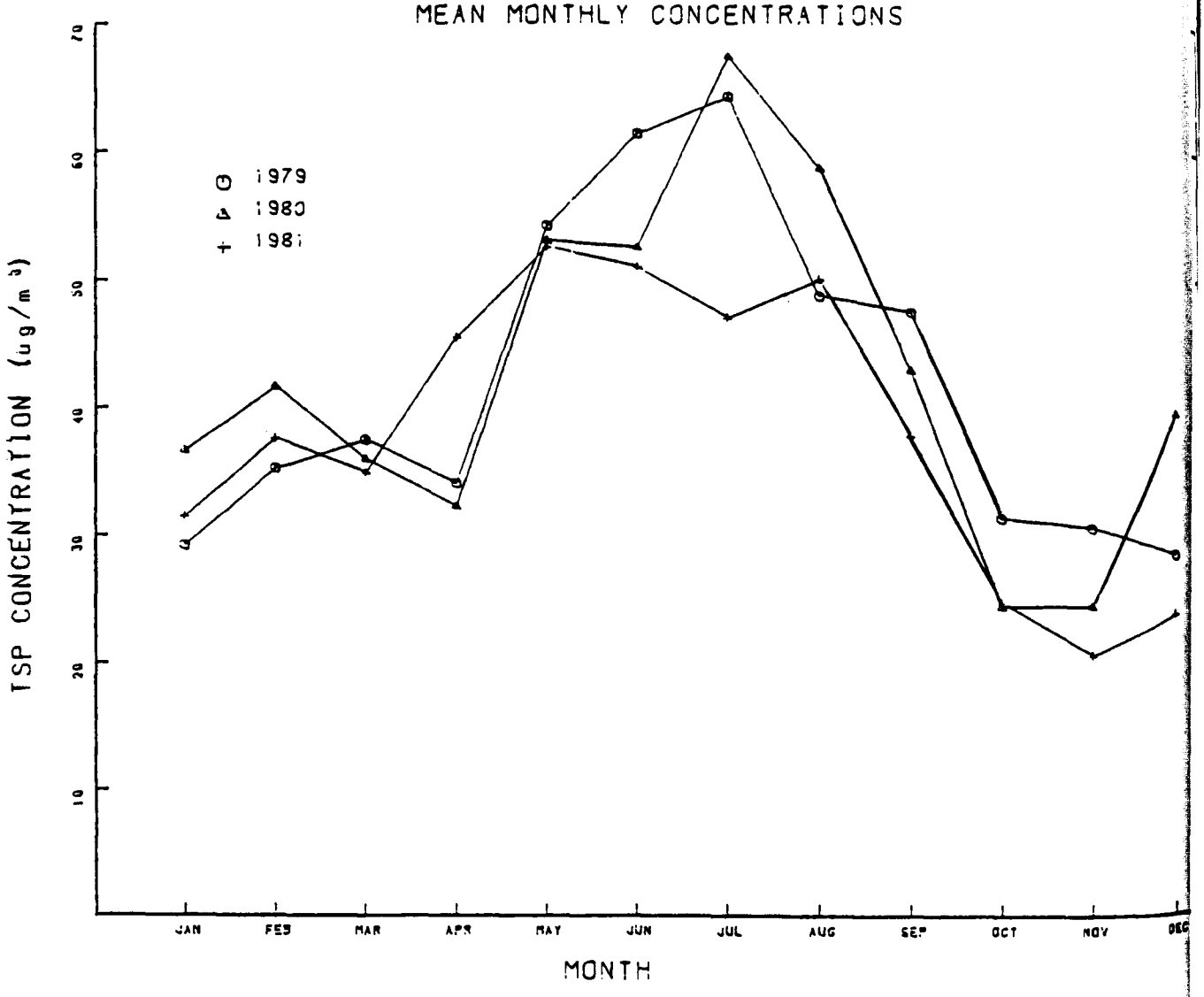
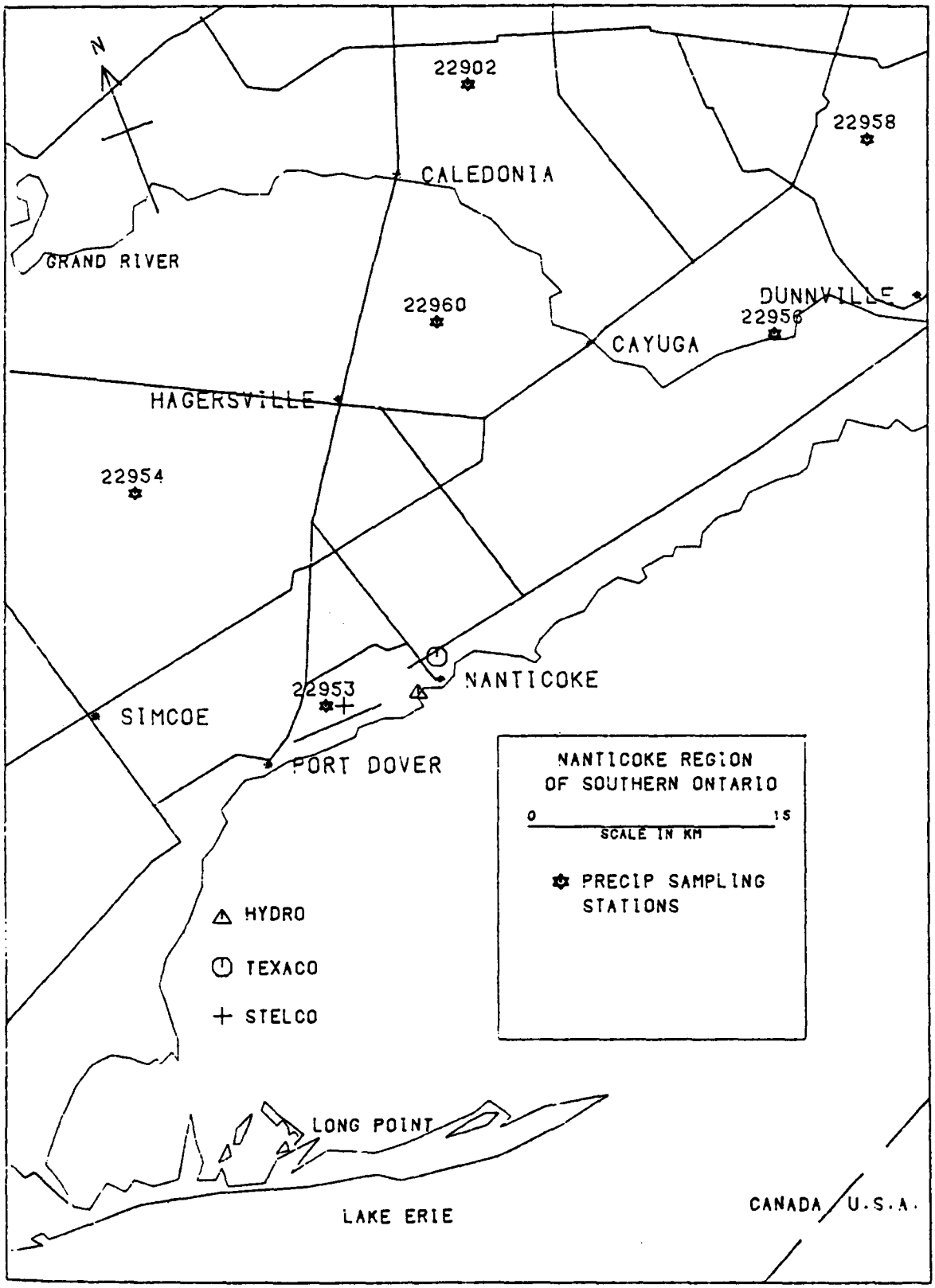


FIGURE 15

PRECIPITATION SAMPLING NETWORK



Appendix 1

NEMP PARTICULATES DATA COLLECTED DURING JANUARY TO DECEMBER 1981.

Sampling dates were chosen according to the daily wind direction. Wind directions were obtained from the 10 m level of the Jarvis meteorological tower. The most frequent direction during the 24 hour sampling period was used. (N/A) corresponds to invalid or missing data while (BDL) represents concentrations reported as below the detection limit. Geometric means were not calculated for elements which reported in excess of 25% of the data below the detection limit. If less than 25 % of the data are below the detection limit then one half the value of the detection limit was used to calculate the geometric mean. All concentrations are expressed in ug/m^3 and are listed station by station. The PAH results for both 1980 and 1981 are included in the Appendix. During 1981 complete PAH results are available for the three stations closest to Stelco (22953, 22961 and 22963) and for the other 5 stations, composite sample results, according to meteorological conditons, have been reported. It is known that PAH sampling on glass fibre filters leaves some doubt as to the validity of the results. PAH loss (anywhere from 20% for Benzo(ghi)Perylene to 85% for Fluorothene) is due to volatilization and oxidation of the PAH compounds on the hi-vol filter (1).

It should also be noted here that, due to the interference between nitric acid and free carbon (during laboratory analysis), the free carbon results and the free carbon to total carbon ratios are somewhat less than expected.

1981 NEMP PARTICULATE TRACE METAL DATA (ng/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SE	TI	V	ZN
22904	81/ 1/16	NNE	.250	.610	N/A	N/A	N/A	N/A	.190	N/A	N/A	N/A	.300	N/A	N/A	N/A
22904	81/ 1/28	NE	.160	.610	.001	BDL	.040	.160	.150	.020	BDL	.018	.124	N/A	.004	.210
22904	81/ 2/15	SSW	1.050	1.500	.004	.014	.320	1.374	.350	.080	.019	.120	2.156	N/A	.004	.635
22904	81/ 2/21	NW	.180	.390	.004	BDL	.497	.205	.130	.005	BDL	.075	.131	N/A	BDL	.069
22904	81/ 2/27	SSE	.300	1.300	.001	BDL	.544	.548	.370	.024	BDL	.093	.450	N/A	BDL	.083
22904	81/ 3/17	NW	2.580	1.800	.001	.007	.027	1.696	.760	.054	BDL	.012	35.245	N/A	.004	.049
22904	81/ 6/ 3	SSW	.300	.310	.001	BDL	.013	.316	.100	.011	BDL	.045	.637	N/A	.005	.044
22904	81/ 6/27	S	.120	1.200	.001	BDL	.016	.536	.290	.024	BDL	.031	.908	N/A	BDL	.038
22904	81/ 7/ 3	SSE	.147	.392	.001	BDL	BDL	.227	.154	.006	BDL	.028	.720	N/A	.003	BDL
22904	81/ 7/21	NNW	.096	.743	.001	BDL	.018	.277	.286	.014	BDL	.072	.566	N/A	BDL	.047
22904	81/ 8/ 8	S	.235	.494	.001	BDL	.024	.380	.121	.010	BDL	.031	.654	N/A	BDL	.047
22904	81/ 9/ 1	S	.191	.294	.002	BDL	.037	.402	.082	.014	BDL	.049	.616	N/A	BDL	.059
22904	81/ 9/25	SSW	.247	2.563	.001	BDL	.410	.894	.710	.037	BDL	.114	1.076	N/A	.009	.075
22904	81/10/13	NE	.315	1.898	.001	BDL	.243	.568	.688	.029	BDL	.101	1.344	N/A	.008	.034
22904	81/10/25	S	.120	.288	.001	BDL	.020	.174	.092	.005	BDL	.042	.386	N/A	BDL	.012
22904	81/11/12	NE	.153	1.576	.001	BDL	.041	.269	.744	.013	BDL	.058	.635	N/A	BDL	.024
22904	81/12/12	NW	.086	1.365	.003	BDL	.048	.120	.375	.005	BDL	.032	.427	N/A	BDL	.023
22904	81/12/24	SW	.143	1.183	.001	BDL	BDL	.665	.301	.020	BDL	.038	.405	N/A	BDL	.073
ARITH MEAN			.371	1.029	.002	.011	.136	.518	.327	.022	.019	.056	2.600	N/A	.005	.090
STD DEV			.575	.650	.001	.003	.183	.425	.233	.019	.000	.033	7.931	N/A	.002	.143
GEO MEAN			.226	.821	.001	.018	.047	.393	.253	.016	.019	.047	.681	N/A	.005	.047
MAXIMUM			2.580	2.563	.004	.014	.544	1.696	.760	.080	.019	.120	35.245	N/A	.009	.635
MINIMUM			.086	.288	.001	.007	.005	.120	.082	.005	.019	.012	.124	N/A	.003	.005
# OF SAMPLE			18	18	17	2	17	17	18	17	1	17	18	0	7	17

1981 NEMP PARTICULATE TRACE METAL DATA (ng/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SE	TI	V	ZN
22951	81/ 1/16	NNE	.220	.660	.002	.010	.024	1.600	.130	.120	.010	.210	.227	N/A	.020	.230
22951	81/ 1/28	NE	.150	.270	.001	BDL	.023	.148	.082	.009	BDL	.031	.049	N/A	BDL	.042
22951	81/ 2/15	SSW	.650	.760	.002	.013	.033	1.039	.240	.035	.009	.130	2.278	N/A	.004	.140
22951	81/ 2/21	NW	BDL	.530	.004	BDL	.037	.170	.170	.007	BDL	.106	.125	N/A	BDL	.078
22951	81/ 2/27	SSE	.210	1.500	.001	.007	.031	.741	.450	.037	BDL	.112	.668	N/A	BDL	.083
22951	81/ 3/17	NW	1.910	2.000	.001	.007	.015	1.487	.670	.052	BDL	.021	18.833	N/A	.003	.039
22951	81/ 3/23	NNE	.240	2.700	.002	.011	.028	1.881	.640	.092	BDL	.222	1.193	N/A	.006	.217
22951	81/ 4/ 4	SW	.840	1.900	.001	.008	BDL	.627	.580	.023	BDL	.215	3.240	N/A	BDL	.040
22951	81/ 4/10	S	.980	2.700	.001	.009	.023	1.275	.760	.044	BDL	.055	5.016	N/A	.004	.128
22951	81/ 4/16	SW	.380	1.500	.001	.007	.015	.628	.420	.023	BDL	.063	1.344	N/A	BDL	.062
22951	81/ 5/ 4	SSE	.930	6.000	.002	.010	.168	1.268	1.400	.042	.011	.137	3.280	N/A	.004	.101
22951	81/ 5/16	NNW	.310	.620	.001	BDL	.106	.206	.240	.006	BDL	.031	.285	N/A	BDL	.017
22951	81/ 6/ 3	SSW	.320	.420	.001	.007	.396	.296	.170	.013	BDL	.039	.415	N/A	BDL	.043
22951	81/ 6/27	S	.150	.920	.001	BDL	.188	.300	.290	.011	BDL	.027	.163	N/A	BDL	.037
22951	81/ 7/ 3	SSE	.198	1.146	.001	BDL	.512	.384	.360	.015	BDL	.032	.870	N/A	BDL	.021
22951	81/ 7/21	NNW	.157	1.347	.001	BDL	.289	.273	.528	.010	BDL	.053	.802	N/A	BDL	.068
22951	81/ 8/ 2	SSW	.255	1.288	.001	BDL	.636	.439	.432	.017	BDL	.092	1.117	N/A	.003	.127
22951	81/ 8/ 8	S	.409	.789	.001	BDL	.606	.573	.333	.015	BDL	.033	2.081	N/A	BDL	.090
22951	81/ 9/ 1	S	.273	.703	.001	BDL	.283	.516	.211	.016	BDL	.057	.916	N/A	BDL	.065
22951	81/ 9/25	SSW	.199	1.859	.001	BDL	.735	.509	.432	.026	BDL	.097	1.038	N/A	.011	.092
22951	81/10/25	S	.238	.535	.001	BDL	.039	.642	.186	.010	BDL	.049	.525	N/A	BDL	.043
22951	81/11/12	NE	.137	1.939	.001	BDL	.010	.400	.811	.030	BDL	.041	.722	N/A	BDL	.073
22951	81/12/12	NW	.133	1.546	.003	BDL	BDL	.187	.511	.006	BDL	.018	.519	N/A	BDL	.028
22951	81/12/24	SW	.263	1.401	.001	BDL	BDL	.289	.415	.017	BDL	.035	.558	N/A	BDL	.311
ARITH MEAN			.398	1.460	.001	.009	.175	.662	.436	.028	.010	.079	1.928	N/A	.007	.091
STD DEV			.403	1.156	.001	.002	.227	.487	.281	.027	.001	.062	3.716	N/A	.006	.071
GEO MEAN			.260	1.152	.001	.009	.058	.510	.359	.020	.010	.060	.829	N/A	.005	.070
MAXIMUM			1.910	6 N/A	.004	.013	.735	1.881	1.400	.120	.011	.222	18.833	N/A	.020	.311
MINIMUM			.005	.270	.001	.007	.005	.148	.082	.006	.009	.018	.049	N/A	.003	.017
# OF SAMPLE			24	24	24	10	24	24	24	24	3	24	24	0	8	24

BDL - below detection limit
N/A - data not available

1981 NEMP PARTICULATE TRACE METAL DATA (ng/m3)

STATION NUMBER	DATE	WIND DIRECTION	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22952	81/ 1/16	NNE	.230	.430	.002	.010	0.210	1.700	.130	.110	.008	.170	.181	N/A	.020	.250
22952	81/ 1/28	NE	.260	.190	.001	BDL	.078	.208	.059	.011	BDL	.025	1.712	N/A	BDL	.041
22952	81/ 2/15	SSW	.460	.460	.002	.011	.075	.964	.150	.037	.011	.103	.365	N/A	.004	.517
22952	81/ 2/21	NW	.130	.230	.004	BDL	.044	.103	.074	.004	BDL	.062	.093	N/A	BDL	.048
22952	81/ 2/27	SSE	.320	1.600	.001	BDL	.041	.517	.390	.070	BDL	.065	.308	N/A	BDL	.082
22952	81/ 3/17	NW	2.570	1.500	.001	BDL	.018	2.042	.740	.069	BDL	.015	20.140	N/A	.004	.038
22952	81/ 3/23	NNE	.500	.790	.001	BDL	.031	.478	.270	.019	BDL	.111	.217	N/A	.005	.079
22952	81/ 4/ 4	SW	.880	.700	.001	BDL	BDL	.477	.190	.019	BDL	.023	.959	N/A	BDL	.032
22952	81/ 4/10	S	1.250	2.800	.001	BDL	.044	1.160	.520	.036	BDL	.040	4.165	N/A	.005	.067
22952	81/ 4/16	SW	.270	.720	.001	BDL	.021	.569	.170	.023	BDL	.046	.439	N/A	.003	.080
22952	81/ 5/ 4	SSE	.530	2.300	.001	BDL	.081	.882	.410	.028	.019	.112	1.208	N/A	.005	.079
22952	81/ 5/16	NNW	.310	.880	.001	BDL	.032	.175	.220	.005	BDL	.028	.319	N/A	BDL	.020
22952	81/ 6/ 3	SSW	.240	.240	.001	BDL	.110	.288	.073	.010	BDL	.033	.256	N/A	.004	.052
22952	81/ 6/27	S	.240	3.900	.001	BDL	.070	.547	.560	.018	BDL	.033	.508	N/A	BDL	.043
22952	81/ 7/ 3	SSE	.139	.300	.001	BDL	.065	.187	.122	.005	BDL	.080	.449	N/A	.004	.025
22952	81/ 7/21	NNW	.132	.603	.001	BDL	.137	.301	.216	.012	BDL	.088	.849	N/A	BDL	.051
22952	81/ 8/ 2	SSW	.335	.733	.001	BDL	.083	.641	.161	.022	BDL	.080	2.630	N/A	.004	.099
22952	81/ 8/ 8	S	.082	.253	.001	BDL	.014	.182	.067	.007	BDL	.036	.426	N/A	BDL	.035
22952	81/ 9/ 1	S	.136	.147	.001	BDL	.053	.229	.043	.007	BDL	.033	.869	N/A	BDL	.024
22952	81/ 9/25	SSW	.170	1.427	.001	BDL	.144	.601	.310	.024	BDL	.062	2.160	N/A	.007	.058
22952	81/10/13	NE	.196	.980	.001	BDL	.084	.409	.280	.027	BDL	.096	2.059	N/A	.008	.032
22952	81/10/25	S	.139	.199	.001	BDL	.021	.141	.058	.004	BDL	.035	.463	N/A	BDL	.014
22952	81/12/12	NW	.080	1.059	.002	BDL	.115	.202	.299	.007	BDL	.029	.500	N/A	BDL	.024
ARITH MEAN			.418	.976	.001	.011	.069	.566	.240	.023	.013	.061	1.795	N/A	.006	.078
STD DEV			.530	.919	.001	.001	.049	.488	.178	.024	.005	.038	4.029	N/A	.004	.105
GEO MEAN			.274	.657	.001	.010	.051	.413	.180	.015	.012	.051	.717	N/A	.005	.052
MAXIMUM			2.570	3.900	.004	.011	.210	2.042	.740	.110	.019	.170	20.140	N/A	.020	.517
MINIMUM			.080	.147	.001	.010	.005	.103	.043	.004	.008	.015	.093	N/A	.003	.014
# OF SAMPLE			23	23	23	2	23	23	23	23	3	23	23	0	12	23

1981 NEMP PARTICULATE TRACE METAL DATA (pg/m3)

STATION NUMBER	DATE	WIND DIRECTION	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22953	81/ 1/16	NNE	.260	.510	.002	.010	.018	1.600	.140	.093	.008	.245	.235	N/A	.020	.200
22953	81/ 1/28	NE	.170	.230	.001	.010	.021	.200	.071	.020	BDL	.021	.106	N/A	.020	.030
22953	81/ 2/15	SSW	.620	1.300	.002	.020	.052	1.300	.310	.069	.010	.076	.917	N/A	.020	.340
22953	81/ 2/21	NW	.180	.230	.003	BDL	.060	.125	.069	.003	BDL	.058	.078	N/A	BDL	.042
22953	81/ 2/27	SSE	.280	1.200	.001	BDL	.034	.630	.310	.031	BDL	.052	.270	N/A	.003	.000
22953	81/ 3/17	NW	2.690	1.400	.001	BDL	BDL	1.735	.580	.053	BDL	.016	7.236	N/A	.004	.030
22953	81/ 3/23	NNE	.150	.690	.001	BDL	.046	.347	.200	.017	BDL	.066	.239	N/A	.001	.047
22953	81/ 4/ 4	SW	N/A	1.100	.001	BDL	BDL	.640	.280	.024	BDL	.025	1.341	N/A	BDL	.033
22953	81/ 4/10	S	1.420	1.700	.001	BDL	.029	1.259	.500	.038	BDL	.041	4.022	N/A	.006	.081
22953	81/ 5/ 4	SSE	.770	2.300	.001	BDL	.072	1.078	.450	.037	BDL	.091	1.947	N/A	.005	.074
22953	81/ 5/16	NNW	.300	.490	.001	BDL	.026	.166	.170	.006	BDL	.023	.388	N/A	BDL	BDL
22953	81/ 6/ 3	SSW	.350	.390	.001	BDL	.045	.350	.110	.012	BDL	.032	.542	N/A	.004	.031
22953	81/ 6/27	S	.210	.780	BDL	BDL	.052	.286	.170	.010	BDL	.026	.506	N/A	BDL	.027
22953	81/ 7/ 3	SSE	.242	.985	.001	BDL	.095	.715	.232	.031	BDL	.022	1.916	N/A	.004	.014
22953	81/ 7/21	NNW	.218	.844	.001	BDL	.082	.299	.308	.013	BDL	.066	1.450	N/A	.003	.063
22953	81/ 8/ 2	SSW	.268	.772	.001	BDL	.099	.504	.187	.021	BDL	.071	3.115	N/A	.004	.085
22953	81/ 8/ 8	S	.127	.329	.001	BDL	.052	.222	.088	.008	BDL	.025	.806	N/A	BDL	.043
22953	81/ 9/ 1	S	.204	.288	.001	BDL	.102	.404	.090	.013	BDL	.044	2.329	N/A	BDL	.043
22953	81/ 9/25	SSW	.167	1.634	.001	BDL	.123	.463	.310	.021	BDL	.072	1.993	N/A	.004	.061
22953	81/10/13	NE	.285	2.718	.001	BDL	.084	.780	.588	.049	BDL	.086	3.627	N/A	.007	.045
22953	81/10/25	S	.125	.614	.001	BDL	.032	.379	.160	.017	BDL	.032	.617	N/A	BDL	.017
22953	81/11/12	NE	.139	2.135	.001	BDL	.052	.347	.748	.020	BDL	.045	.989	N/A	BDL	.031
22953	81/12/12	NW	.082	1.374	.002	BDL	.032	.097	.303	.004	BDL	.027	.531	N/A	BDL	.021
22953	81/12/24	SW	.092	.409	.001	BDL	BDL	.153	.101	.005	BDL	.038	.497	N/A	BDL	.031
ARITH MEAN			.431	1.018	.001	.013	.051	.587	.270	.026	.009	.054	1.487	N/A	.008	.062
STD DEV			.565	.677	.001	.005	.032	.463	.180	.022	.001	.045	1.625	N/A	.007	.069
GEO MEAN			.274	.803	.001	.013	.038	.433	.216	.018	.009	.044	.845	N/A	.006	.043
MAXIMUM			2.690	2.718	.003	.020	.123	1.735	.748	.093	.010	.245	7.236	N/A	.020	.340
MINIMUM			.082	.230	N/A	.010	.005	.077	.069	.003	.008	.016	.078	N/A	.003	.005
# OF SAMPLE			24	24	24	3	24	24	24	24	2	24	24	0	14	24

BDL = below detection limit
N/A = data not available

BDL = below detection limit
N/A = data not available

1981 NEMP PARTICULATE TRACE METAL DATA (ng/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22955	81/ 1/16	NNE	.200	.440	.002	BDL	.053	1.613	.150	.098	.007	.314	.177	N/A	.013	.264
22955	81/ 1/28	NE	.200	.340	.001	BDL	.077	.182	.090	.020	BDL	.047	.046	N/A	BDL	.030
22955	81/ 2/15	SSW	.610	1.100	.003	BDL	.117	1.137	.370	.042	BDL	.132	.930	N/A	.005	.146
22955	81/ 2/21	NW	.160	.370	.001	BDL	.074	.188	.100	.006	BDL	.058	.048	N/A	BDL	.041
22955	81/ 2/27	SSE	.150	2.000	.001	BDL	.068	.495	1.200	.019	BDL	.088	.774	N/A	.003	.067
22955	81/ 3/17	NW	1.490	1.600	.001	BDL	.011	1.184	.750	.040	BDL	.046	7.269	N/A	.003	.028
22955	81/ 3/23	NNE	.210	2.100	.001	BDL	.033	.244	.890	.011	BDL	.077	1.439	N/A	.003	.056
22955	81/ 4/ 4	SW	.740	.760	.001	BDL	BDL	.506	.220	.018	BDL	.021	1.908	N/A	BDL	.028
22955	81/ 4/10	S	.900	1.600	.001	BDL	.016	1.108	.470	.037	BDL	.050	5.234	N/A	.004	.059
22955	81/ 4/16	SW	.310	.620	.001	BDL	.012	.432	.170	.016	BDL	.036	.583	N/A	BDL	.057
22955	81/ 5/ 4	SSE	.560	2.000	.001	BDL	.054	.887	.640	.025	.016	.133	1.960	N/A	.003	.065
22955	81/ 6/ 3	SSW	.210	.150	.001	BDL	.021	.168	.049	.003	BDL	.020	.143	N/A	BDL	.023
22955	81/ 6/27	S	.210	1.500	.001	BDL	.026	.330	.630	.009	BDL	.052	.550	N/A	BDL	.027
22955	81/ 7/ 3	SSE	.155	.474	.001	BDL	.055	.192	.246	.005	BDL	.042	.737	N/A	.003	.014
22955	81/ 8/ 2	SSW	.298	.859	.001	BDL	.024	.518	.324	.021	BDL	.077	2.617	N/A	.004	.006
22955	81/ 8/ 8	S	.109	.429	.001	BDL	BDL	.195	.191	.007	BDL	.020	.420	N/A	BDL	.027
22955	81/ 9/ 1	S	.166	.262	.001	BDL	.015	.206	.125	.005	BDL	.028	.611	N/A	BDL	.010
22955	81/ 9/25	SSW	.227	1.626	.001	BDL	.035	.503	.615	.024	BDL	.065	1.150	N/A	.007	.057
22955	81/10/13	NE	.299	1.456	.001	BDL	.065	.484	.506	.033	BDL	.083	.937	N/A	.009	.027
22955	81/10/25	S	.104	.214	.001	BDL	.017	.128	.085	.004	BDL	.031	.319	N/A	BDL	.020
22955	81/11/12	NE	.126	.997	.001	BDL	.630	.208	.535	.009	BDL	.029	.469	N/A	BDL	.063
22955	81/12/12	NW	.155	1.647	.003	BDL	.178	.926	.602	.028	BDL	.041	.309	N/A	BDL	.201
22955	81/12/24	SW	.235	1.247	.001	BDL	.036	.289	.402	.024	.010	.025	.363	N/A	BDL	.379
ARITH MEAN			.340	1.069	.001	N/A	.071	.527	.407	.022	.011	.066	1.226	N/A	.005	.077
STD DEV			.320	.700	.001	N/A	.126	.404	.290	.020	.004	.061	1.701	N/A	.003	.088
GEO MEAN			.256	.816	.001	N/A	.035	.401	.299	.016	.010	.051	.604	N/A	.005	.051
MAXIMUM			1.490	2.800	.003	N/A	.630	1.613	1.200	.098	.016	.314	7.269	N/A	.013	.379
MINIMUM			.104	.150	.001	N/A	.005	.128	.049	.004	.007	.020	.046	N/A	.003	.014
# OF SAMPLE			23	23	23	0	23	23	23	23	3	23	23	0	11	23

1981 NEMP PARTICULATE TRACE METAL DATA (ng/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22957	81/ 1/28	NE	BDL	.740	.001	.008	.150	.230	.260	.020	BDL	.037	.191	N/A	.010	BDL
22957	81/ 2/21	NW	BDL	.760	.004	BDL	.110	.148	.160	.005	BDL	.065	.073	N/A	BDL	.055
22957	81/ 2/27	SSE	.230	2.600	.001	BDL	.059	.684	1.100	.027	BDL	.100	.583	N/A	.003	.088
22957	81/ 3/17	NW	1.600	1.900	.001	BDL	.024	1.402	.880	.047	BDL	.029	5.294	N/A	.003	.034
22957	81/ 3/23	NNE	.220	2.100	.001	BDL	.046	.495	.760	.018	BDL	.113	.692	N/A	.004	.072
22957	81/ 4/ 4	SW	.770	1.100	.001	BDL	BDL	.626	.380	.022	BDL	.022	2.176	N/A	BDL	.029
22957	81/ 4/10	S	1.120	4.800	.001	BDL	.029	1.407	2.200	.043	BDL	.051	8.520	N/A	.004	.075
22957	81/ 4/16	SW	.310	2.200	.001	BDL	.013	.653	.880	.029	BDL	.043	1.323	N/A	.003	.071
22957	81/ 5/ 4	SSE	.570	4.500	.002	BDL	.061	1.066	2.100	.028	.012	.105	3.053	N/A	.003	.082
22957	81/ 5/16	NNW	BDL	.560	.001	BDL	.035	.187	.270	.004	BDL	.024	.224	N/A	BDL	.010
22957	81/ 6/ 3	SSW	.150	.200	.001	BDL	.031	.236	.093	.008	BDL	.036	.234	N/A	BDL	.038
22957	81/ 6/27	S	.460	3.100	.001	BDL	.080	.512	1.200	.014	BDL	.034	1.235	N/A	BDL	.037
22957	81/ 7/ 3	SSE	.297	2.335	.001	BDL	.111	.357	.945	.008	BDL	.040	1.710	N/A	.003	.011
22957	81/ 7/21	NNW	.118	1.257	.001	BDL	.120	.203	.683	.008	BDL	.041	.376	N/A	BDL	.029
22957	81/ 8/ 2	SSW	.300	2.161	.001	BDL	.152	.510	.906	.018	BDL	.078	1.541	N/A	.003	.066
22957	81/ 8/ 8	S	.165	1.084	.001	BDL	.105	.280	.513	.009	BDL	.033	.827	N/A	BDL	.066
22957	81/ 9/ 1	S	.171	.473	.001	BDL	.117	.240	.217	.007	BDL	.029	.570	N/A	BDL	.030
22957	81/ 9/25	SSW	.220	1.782	.001	BDL	.201	.569	.617	.027	BDL	.061	1.020	N/A	.009	.062
22957	81/10/13	NE	.307	2.016	.001	BDL	.028	.474	.835	.030	BDL	.079	1.438	N/A	.007	.076
22957	81/10/25	S	.141	.703	.001	BDL	.023	.184	.351	.005	BDL	.039	.561	N/A	BDL	.013
22957	81/11/12	NE	.167	1.368	.001	BDL	.021	.250	.711	.012	BDL	.040	.836	N/A	BDL	.020
22957	81/12/12	NW	.175	1.683	.002	BDL	.022	.320	.697	.011	BDL	.037	.678	N/A	BDL	.027
22957	81/12/24	SW	.241	1.264	.001	BDL	.021	.304	.384	.026	BDL	.032	.399	N/A	BDL	.309
ARITH MEAN			.337	1.769	.001	.008	.068	.493	.749	.019	.012	.051	1.459	N/A	.005	.055
STD DEV			.366	1.149	.001	N/A	.053	.352	.529	.012	N/A	.026	1.878	N/A	.003	.060
GEO MEAN			.170	1.406	.001	.008	.047	.399	.579	.015	.012	.045	.827	N/A	.004	.037
MAXIMUM			1.600	4.800	.004	.008	.201	1.407	2.200	.047	.012	.113	8.520	N/A	.010	.309
MINIMUM			.005	.200	.001	.008	.005	.148	.093	.004	.012	.022	.073	N/A	.003	.005
# OF SAMPLE			23	23	23	1	23	23	23	23	1	23	23	0	11	23

BDL - below detection limit
N/A - data not available

1981 NFMP Particulates Trace Metal Data (ug/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22959	81/ 3/17	NW	2.460	1.700	.001	BDL	BDL	1.990	.600	.055	BDL	.015	16.410	N/A	.005	.030
22959	81/ 3/23	NNE	BDL	1.300	.001	BDL	.027	1.007	.270	.047	BDL	.122	.297	N/A	.006	.114
22959	81/ 4/ 4	SW	.670	1.100	.001	BDL	BDL	1.175	.290	.039	BDL	.063	2.163	N/A	.005	.107
22959	81/ 4/10	S	1.080	1.100	.001	BDL	BDL	1.110	.330	.036	BDL	.063	5.062	N/A	.005	.101
22959	81/ 4/16	SW	.350	.610	.001	BDL	BDL	.627	.150	.024	BDL	.052	.493	N/A	BDL	.091
22959	81/ 5/ 4	SSE	.420	1.500	.001	BDL	.012	.766	.320	.027	.008	.074	1.697	N/A	.005	.070
22959	81/ 5/16	NNW	.170	.590	.001	BDL	.018	.152	.140	.006	BDL	.027	.259	N/A	BDL	.016
22959	81/ 6/ 3	SSW	.260	.350	.001	BDL	BDL	.278	.095	.009	BDL	.030	.246	N/A	.003	.030
22959	81/ 6/27	S	.260	.910	.001	BDL	.014	.158	.140	.006	BDL	.030	.344	N/A	.003	.010
22959	81/ 7/ 3	SSE	.190	1.155	.001	BDL	BDL	.294	.240	.009	BDL	.025	.841	N/A	.003	.013
22959	81/ 7/21	NNW	.139	1.285	.001	BDL	.016	.183	.282	.009	BDL	.029	.452	N/A	BDL	.016
22959	81/ 8/ 2	SSW	.238	.667	.001	BDL	.020	.443	.157	.021	BDL	.066	.603	N/A	.005	.076
22959	81/ 8/ 8	S	.052	.317	.001	BDL	BDL	.205	.083	.009	BDL	.022	.195	N/A	BDL	.047
22959	81/ 9/ 1	S	.188	.407	.001	BDL	BDL	.475	.079	.015	BDL	.046	.464	N/A	BDL	.061
22959	81/ 9/25	SSW	.182	1.394	.001	BDL	.015	.483	.334	.028	BDL	.052	.916	N/A	BDL	.083
22959	81/10/13	NE	.217	1.420	.001	BDL	.012	.544	.315	.029	BDL	.099	.599	N/A	.009	.036
22959	81/10/25	S	.091	.316	.001	BDL	BDL	.225	.064	.007	BDL	.033	.259	N/A	BDL	.022
22959	81/11/12	NE	.117	.972	.001	BDL	BDL	.297	.309	.010	BDL	.029	.307	N/A	BDL	.030
22959	81/12/12	NW	.018	.800	.001	BDL	.016	.072	.172	.003	BDL	.017	.188	N/A	BDL	BDL
22959	81/12/24	SW	.076	.802	.001	BDL	BDL	.145	.115	.008	BDL	.016	.210	N/A	BDL	.134
ARITH MEAN			.359	.935	.001	N/A	.017	.531	.225	.020	.008	.046	1.600	N/A	.005	.055
STD DEV			.539	.414	N/A	N/A	.004	.465	.126	.015	N/A	.028	3.569	N/A	.002	.039
GEO MEAN			.172	.828	.001	N/A	.016	.378	.193	.015	.008	.038	.599	N/A	.005	.039
MAXIMUM			2.460	1.700	.001	N/A	.027	1.990	.600	.055	.008	.122	16.410	N/A	.009	.134
MINIMUM			.005	.316	.001	N/A	.012	.072	.064	.003	.008	.015	.188	N/A	.003	.005
# OF SAMPLE			20	20	20	0	9	20	20	20	1	20	20	0	10	20

1981 NFMP PARTICULATE TRACE METAL DATA (ug/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22961	81/ 1/16	NNE	.170	.660	.002	.020	.020	1.500	.160	.100	.008	.252	.223	N/A	.020	.200
22961	81/ 1/28	NE	.170	.370	.001	.010	.014	.162	.110	.019	BDL	.029	.160	N/A	.012	.016
22961	81/ 3/17	NW	2.010	1.800	.001	BDL	.022	1.705	.710	.061	BDL	.025	17.865	N/A	.004	.030
22961	81/ 3/23	NNE	.270	2.400	.001	BDL	.041	1.240	.630	.057	BDL	.133	.453	N/A	.006	.140
22961	81/ 4/ 4	SW	.880	3.900	.001	BDL	.013	1.808	.930	.109	BDL	.035	2.467	N/A	.004	.137
22961	81/ 4/10	S	1.500	7.700	.001	BDL	.057	3.101	1.900	.190	BDL	.066	8.459	N/A	.009	.174
22961	81/ 5/ 4	SSE	.840	3.800	.001	BDL	.052	1.761	.950	.053	.013	.124	2.458	N/A	.004	.079
22961	81/ 5/16	NNW	.270	1.400	.001	BDL	.011	.443	.390	.020	BDL	.024	.288	N/A	BDL	.022
22961	81/ 6/ 3	SSW	.250	1.200	.001	BDL	.022	.816	.280	.038	BDL	.052	.603	N/A	.004	.043
22961	81/ 6/27	S	.340	4.100	.001	BDL	.107	1.833	.690	.102	BDL	.068	.710	N/A	BDL	.064
22961	81/ 7/ 3	SSE	.124	.698	.001	BDL	.067	.277	.194	.011	BDL	.020	.750	N/A	.003	.017
22961	81/ 7/21	NNW	.127	1.069	.001	BDL	.181	.429	.384	.025	BDL	.062	N/A	N/A	BDL	.066
22961	81/ 8/ 2	SSW	.305	1.314	.001	BDL	.075	.667	.286	.036	BDL	.076	1.066	N/A	.004	.100
22961	81/ 8/ 8	S	.098	.449	.001	BDL	.026	.259	.124	.011	BDL	.022	.272	N/A	BDL	.046
22961	81/ 9/ 1	S	.187	.537	.001	BDL	.056	.459	.134	.023	BDL	.038	.511	N/A	BDL	.072
22961	81/ 9/25	SSW	.253	3.020	.001	BDL	.281	1.030	.710	.061	BDL	.084	1.325	N/A	.007	.065
22961	81/10/13	NE	.234	1.691	.001	BDL	.030	.433	.528	.027	BDL	.072	1.125	N/A	.008	.029
22961	81/10/25	S	.091	.312	.001	BDL	.026	.192	.114	.007	BDL	.027	.246	N/A	BDL	.020
22961	81/11/12	NE	.175	2.250	.001	BDL	.052	.387	.816	.019	BDL	.035	.795	N/A	BDL	.031
22961	81/12/12	NW	.051	1.436	.002	BDL	.117	.139	.428	.007	BDL	.031	.404	N/A	BDL	.017
22961	81/12/24	SW	.161	1.931	.001	BDL	.071	1.142	.447	.057	BDL	.031	.299	N/A	BDL	.061
ARITH MEAN			.412	2.002	.001	.015	.061	.942	.520	.049	.011	.062	1.774	N/A	.007	.070
STD DEV			.499	1.709	N/A	.005	.064	.757	.408	.044	.003	.053	3.110	N/A	.005	.053
GEO MEAN			.256	1.434	.001	.014	.041	.661	.388	.034	.010	.049	.768	N/A	.006	.053
MAXIMUM			2.010	7.700	.002	.020	.281	3.101	1.900	.190	.013	.252	17.865	N/A	.020	.200
MINIMUM			.051	.312	.001	.010	.011	.139	.110	.007	.008	.020	.160	N/A	.003	.016
# OF SAMPLE			21	21	21	2	21	21	21	21	2	21	20	0	12	21

# OF SAMPLE	21	21	21	2	21	21	21	21	4	--	--

BDL - below detection limit
N/A - data not available

1981 NEMP PARTICULATE TRACE METAL DATA (ug/m3)

STAT'N NUMBER	DATE	WIND DIRECT'N	AL	CA	CD	CR	CU	FE	MG	MN	NI	PB	SI	TI	V	ZN
22963	81/ 7/ 3	SSE	.384	7.133	.001	BDL	.096	1.537	1.331	.091	BDL	.039	2.489	N/A	.005	.076
22963	81/ 7/21	NNW	.105	1.071	.001	BDL	.012	.240	.359	.012	BDL	.054	.449	N/A	BDL	.045
22963	81/ 8/ 2	SSW	.315	1.664	.001	BDL	.039	.629	.319	.025	BDL	.086	2.643	N/A	.004	.081
22963	81/ 8/ 8	S	.233	.933	.001	BDL	.011	.560	.225	.017	BDL	.037	1.237	N/A	BDL	.066
22963	81/ 9/ 1	S	.162	1.590	.001	BDL	.016	.592	.327	.031	BDL	.057	.870	N/A	BDL	.062
22963	81/ 9/25	SSW	.220	3.347	.001	BDL	.051	.973	.649	.052	BDL	.098	2.155	N/A	.007	.081
22963	81/10/13	NE	.811	2.398	.001	BDL	.116	1.158	.808	.040	BDL	.111	16.704	N/A	.009	.045
22963	81/10/25	S	.126	.659	.001	BDL	.071	.456	.169	.017	BDL	.053	.269	N/A	BDL	.067
22963	81/11/12	NE	.160	3.258	.001	BDL	.080	.393	1.018	.021	BDL	.059	.674	N/A	BDL	.030
22963	81/12/12	NW	.062	1.380	.003	BDL	.072	.117	.349	.004	BDL	.033	.201	N/A	BDL	.022
22963	81/12/24	SW	.095	.585	.001	BDL	BDL	.173	.144	.006	BDL	.044	.203	N/A	BDL	.024
ARITH MEAN			.243	2.183	.001	N/A	.052	.621	.518	.029	N/A	.061	2.536	N/A	.006	.055
STD DEV			.202	1.809	.001	N/A	.036	.419	.368	.024	N/A	.025	4.565	N/A	.002	.020
GEO MEAN			.188	1.659	.001	N/A	.035	.480	.407	.020	N/A	.057	.985	N/A	.006	.051
MAXIMUM			.811	7.133	.003	N/A	.116	1.537	1.331	.091	N/A	.111	16.704	N/A	.009	.081
MINIMUM			.062	.585	.001	N/A	.005	.117	.144	.004	N/A	.033	.201	N/A	.004	.022
# OF SAMPLE			11	11	11	0	11	11	11	11	0	11	11	0	4	11

BDL - below detection limit
N/A - data not available

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22904	81/ 1/16	NNE	.2700	.0440	4.5000	2.9000	BDL	9.4000
22904	81/ 1/28	NE	.2300	.0360	.4000	.6000	BDL	1.2000
22904	81/ 2/15	SSW	.4000	.0580	6.5000	5.2000	BDL	14.8000
22904	81/ 2/21	NW	.3000	.0430	1.3000	3.0000	BDL	2.3000
22904	81/ 2/27	SSE	.3000	.0440	2.9000	3.0000	BDL	7.3000
22904	81/ 3/17	NW	.1800	.0460	3.7000	2.3000	BDL	8.5000
22904	81/ 6/ 3	SSW	.2400	.0410	1.1000	3.0000	BDL	13.7000
22904	81/ 6/27	S	.2100	.0480	.6000	1.3000	BDL	2.0000
22904	81/ 7/ 3	SSE	.1300	.0100	2.0000	2.0000	.1000	7.5000
22904	81/ 7/21	NNW	.1300	.0100	2.7000	4.9000	.1000	11.9000
22904	81/ 8/ 8	S	.1300	.0100	3.5000	2.0000	.1000	9.1000
22904	81/ 9/ 1	S	.0100	BDL	3.2000	1.3000	.1000	13.6000
22904	81/ 9/25	SSW	.5200	.0100	.8000	5.3000	BDL	3.8000
22904	81/10/13	NE	.4500	.0100	1.8000	6.4000	.1000	6.0000
22904	81/10/25	S	.1800	BDL	1.4000	2.2000	.1000	4.2000
22904	81/11/12	NE	.2100	.0100	.6000	1.6000	BDL	1.8000
22904	81/12/12	NW	.5200	BDL	.6000	1.5000	BDL	2.3000
22904	81/12/24	SW	.2100	BDL	2.3000	4.7000	.1000	7.3000
ARITH MEAN			.2567	.0244	2.2167	2.9556	.1000	7.0389
STD DEV			.1352	.0189	1.5847	1.6167	.0000	4.3145
GEO MEAN			.2056	.0167	1.6759	2.5103	.1000	5.4950
MAXIMUM			.5200	.0580	6.5000	6.4000	.1000	14.8000
MINIMUM			.0100	.0050	.4000	.6000	.1000	1.2000
# OF SAMPLE			18	18	18	18	7	18

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22951	81/ 1/16	NNE	.6100	.0540	3.5000	6.0000	BDL	6.5000
22951	81/ 1/28	NE	.2700	.0510	1.6000	2.7000	BDL	4.1000
22951	81/ 2/15	SSW	.6000	.0620	1.4000	N/A	BDL	14.4000
22951	81/ 2/21	NW	.2300	.0500	1.6000	3.5000	BDL	4.2000
22951	81/ 2/27	SSE	.2000	.0640	3.7000	5.7000	BDL	10.1000
22951	81/ 3/17	NW	.2300	.0570	1.8000	1.9000	BDL	4.3000
22951	81/ 3/23	NNE	.0800	.1010	5.8000	1.6000	BDL	13.9000
22951	81/ 4/ 4	SW	.2800	.0630	.4000	1.4000	BDL	1.7000
22951	81/ 4/10	S	.2800	.0720	5.2000	5.3000	BDL	12.3000
22951	81/ 4/16	SW	.1900	.0560	1.9000	4.8000	BDL	3.0000
22951	81/ 5/ 4	SSE	.4800	.0770	4.5000	6.3000	BDL	9.3000
22951	81/ 5/16	NNW	.0900	.0550	3.0000	2.2000	BDL	7.1000
22951	81/ 6/ 3	SSW	.3600	.0550	6.9000	5.3000	BDL	9.8000
22951	81/ 6/27	S	.3500	.0560	1.6000	4.7000	BDL	4.2000
22951	81/ 7/ 3	SSE	.4600	.0100	1.8000	2.5000	.1000	7.200
22951	81/ 7/21	NNW	.2100	.0100	2.9000	3.1000	.1000	9.5000
22951	81/ 8/ 2	SSW	.2800	.0100	7.5000	4.7000	.1000	25.6000
22951	81/ 8/ 8	S	.2600	.0100	2.4000	3.1000	.1000	9.3000
22951	81/ 9/ 1	S	.4500	.0100	4.3000	3.6000	.1000	13.4000
22951	81/ 9/25	SSW	.5800	.0100	.9000	5.5000	BDL	4.1000
22951	81/10/25	S	.6700	.0100	1.8000	3.2000	.1000	4.5000
22951	81/11/12	NE	.3300	.0100	.8000	2.0000	BDL	3.0000
22951	81/12/12	NW	.6600	.0100	.8000	1.3000	BDL	2.6000
22951	81/12/24	SW	.7700	.0100	1.9000	6.1000	.1000	5.4000
ARITH MEAN			.3717	.0405	2.8333	3.7609	.1000	7.8958
STD DEV			.1885	.0277	1.9209	1.6231	.0000	5.2470
GEO MEAN			.3207	.0288	2.2294	3.3705	.1000	6.4622
MAXIMUM			.7700	.1010	7.5000	6.3000	.1000	25.6000
MINIMUM			.0800	.0100	.4000	1.3000	.1000	1.7000
# OF SAMPLE			24	24	24	23	7	24

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22952	81/ 1/16	NNE	.7000	.0540	2.6000	7.1000	BDL	10.9000
22952	81/ 1/28	NE	.3000	.0440	3.6000	2.3000	BDL	8.1000
22952	81/ 2/15	SSW	.4300	.0520	1.9000	4.6000	BDL	4.9000
22952	81/ 2/21	NW	.2200	.0440	.9000	2.1000	BDL	3.8000
22952	81/ 2/27	SSE	.0800	.0490	5.7000	2.6000	BDL	13.7000
22952	81/ 3/17	NW	.2600	.0530	.7000	1.6000	BDL	2.6000
22952	81/ 3/23	NNE	.3200	.0510	5.7000	5.0000	BDL	14.0000
22952	81/ 4/ 4	SW	.1900	.0570	1.4000	3.4000	BDL	2.6000
22952	81/ 4/10	S	.6200	.0560	5.6000	8.7000	BDL	10.0000
22952	81/ 4/16	SW	.1800	.0500	4.1000	3.0000	BDL	8.2000
22952	81/ 5/ 4	SSE	.5900	.0550	1.8000	3.9000	BDL	3.8000
22952	81/ 5/16	NNW	.2400	.0560	.8000	1.5000	BDL	2.2000
22952	81/ 6/ 3	SSW	1.1800	.0570	3.8000	4.3000	BDL	9.5000
22952	81/ 6/27	S	.2100	.0590	1.3000	2.1000	BDL	3.5000
22952	81/ 7/ 3	SSE	.1500	BDL	2.1000	1.9000	.1000	7.1000
22952	81/ 7/21	NNW	.2400	BDL	2.4000	5.3000	.1000	11.2000
22952	81/ 8/ 2	SSW	.0700	BDL	4.3000	.1000	.1000	29.2000
22952	81/ 8/ 8	S	.1300	BDL	8.5000	1.7000	.1000	10.1000
22952	81/ 9/ 1	S	.1200	.0100	2.6000	.3000	.1000	11.4000
22952	81/ 9/25	SSW	.3300	.0100	.7000	3.6000	BDL	3.2000
22952	81/10/13	NE	.4000	BDL	2.0000	5.8000	.1000	6.0000
22952	81/10/25	S	.0600	BDL	1.2000	1.6000	.1000	4.0000
22952	81/12/12	NW	.7000	.0100	.6000	1.3000	BDL	2.2000
	ARITH MEAN		.3357	.0451	2.7956	3.2087	.1000	7.9217
	STD DEV		.2615	.0168	2.0211	2.0949	.0000	5.8729
	GEO MEAN		.2545	.0391	2.1410	2.3502	.1000	6.2726
	MAXIMUM		1.1800	.0590	8.5000	8.7000	.1000	29.2000
	MINIMUM		.0600	.0100	.6000	.1000	.1000	2.2000
	# OF SAMPLE		23	17	23	23	7	23

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22953	81/ 1/16	NNE	.4800	.0650	1.9000	5.1000	BDL	4.5000
22953	81/ 1/28	NE	.2800	.0590	2.5000	5.2000	BDL	4.6000
22953	81/ 2/15	SSW	.3300	.0720	6.7000	9.2000	BDL	16.000
22953	81/ 2/21	NW	.1400	.0640	1.8000	1.4000	BDL	4.70
22953	81/ 2/27	SSE	.3000	.0780	1.5000	3.0000	BDL	3.40
22953	81/ 3/17	NW	.2700	.0740	.7000	1.5000	BDL	2.200
22953	81/ 3/23	NNE	.3900	.0580	3.6000	4.8000	BDL	6.7000
22953	81/ 4/ 4	SW	.2300	.0630	2.1000	3.0000	BDL	5.3000
22953	81/ 4/10	S	.3400	.0500	1.6000	4.3000	BDL	3.9000
22953	81/ 5/ 4	SSE	.3900	.0670	8.3000	8.2000	BDL	19.2000
22953	81/ 5/16	NNW	.1100	.0540	1.5000	2.0000	BDL	3.7000
22953	81/ 6/ 3	SSW	.1500	.0500	5.6000	3.6000	BDL	11.4000
22953	81/ 6/27	S	.2000	.0540	.4000	1.3000	BDL	1.5000
22953	81/ 7/ 3	SSE	.3700	.0100	2.0000	3.0000	BDL	7.4000
22953	81/ 7/21	NNW	.3300	.0100	4.3000	5.2000	.1000	12.5000
22953	81/ 8/ 2	SSW	.3400	BDL	8.0000	4.0000	.1000	24.8000
22953	81/ 8/ 8	S	.3000	BDL	2.7000	2.7000	.1000	8.9000
22953	81/ 9/ 1	S	.2600	BDL	3.6000	3.4000	.1000	11.7000
22953	81/ 9/25	SSW	.3600	.0100	.7000	3.8000	BDL	3.3000
22953	81/10/13	NE	.3900	.0100	1.3000	5.8000	BDL	5.8000
22953	81/10/25	S	.2100	.0100	1.2000	2.4000	BDL	3.7000
22953	81/11/12	NE	.2200	.0100	.5000	1.6000	BDL	2.1000
22953	81/12/12	NW	.4300	.0100	.5000	1.4000	BDL	2.0000
22953	81/12/24	SW	.2600	.0100	1.6000	4.7000	BDL	3.4000
	ARITH MEAN		.2950	.0376	2.6917	3.7750	.1000	7.1958
	STD DEV		.0923	.0275	2.2625	2.0067	.0000	5.8318
	GEO MEAN		.2782	.0245	1.9151	3.2757	.1000	5.4508
	MAXIMUM		.4800	.0780	8.3000	9.2000	.1000	24.8000
	MINIMUM		.1100	.0050	.4000	1.3000	.1000	1.5000
	# OF SAMPLE		24	24	24	24	4	24

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22955	81/ 1/16	NNE	.3900	.0760	6.3000	6.2000	BDL	14.7000
22955	81/ 1/28	NE	.2400	.0630	1.5000	3.8000	BDL	2.6000
22955	81/ 2/15	SSW	.3000	.0750	4.0000	6.9000	BDL	11.4000
22955	81/ 2/21	NW	.2200	.0500	3.8000	4.5000	BDL	8.6000
22955	81/ 2/27	SSE	.4400	.0500	1.4000	4.2000	BDL	4.7000
22955	81/ 3/17	NW	.3600	.0510	.6000	1.4000	BDL	1.9000
22955	81/ 3/23	NNE	.5300	.0520	2.0000	4.6000	BDL	4.0000
22955	81/ 4/ 4	SW	.2000	.0580	1.4000	2.6000	BDL	4.0000
22955	81/ 4/10	S	.2100	.0590	1.4000	3.4000	BDL	2.9000
22955	81/ 4/16	SW	.1200	.0540	1.6000	3.6000	BDL	3.700
22955	81/ 5/ 4	SSE	.1200	.0570	3.8000	5.8000	BDL	11.200
22955	81/ 6/ 3	SSW	.0300	.0500	4.0000	1.0000	BDL	10.200
22955	81/ 6/27	S	.1300	.0510	.4000	.7000	BDL	1.4000
22955	81/ 7/ 3	SSE	.0900	BDL	1.9000	2.1000	BDL	6.3000
22955	81/ 8/ 2	SSW	BDL	BDL	7.9000	.1000	.1000	27.8000
22955	81/ 8/ 8	S	.0300	BDL	2.2000	2.3000	BDL	8.4000
22955	81/ 9/ 1	S	.0100	BDL	3.7000	1.3000	BDL	11.1000
22955	81/ 9/25	SSW	.2500	.0100	.8000	4.3000	.1000	3.4000
22955	81/10/13	NE	.5200	.0100	1.8000	6.4000	BDL	5.5000
22955	81/10/25	S	.0300	.0100	1.1000	2.1000	BDL	3.6000
22955	81/11/12	NE	.1300	.0100	.5000	1.4000	BDL	1.5000
22955	81/12/12	NW	1.1000	.0100	.6000	1.5000	BDL	3.1000
22955	81/12/24	SW	.3600	.0100	1.3000	5.1000	BDL	4.4000
ARITH MEAN			.2528	.0359	2.3478	3.2739	.1000	6.8000
STD DEV			.2389	.0254	1.8759	1.9434	.0000	5.7739
GEO MEAN			.1423	.0237	1.7414	2.4614	.1000	5.1210
MAXIMUM			1.1000	.0760	7.9000	6.9000	.1000	27.8000
MINIMUM			.0050	.0050	.4000	.1000	.1000	1.4000
# OF SAMPLE			23	23	23	23	2	23

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22957	81/ 1/28	NE	.5800	.0520	1.1000	3.2000	BDL	2.4000
22957	81/ 2/21	NW	.1800	.0560	3.7000	2.5000	BDL	9.2000
22957	81/ 2/27	SSE	.6100	.0630	1.4000	3.4000	BDL	3.7000
22957	81/ 3/17	NW	.2200	.1320	.7000	1.4000	BDL	2.3000
22957	81/ 3/23	NNE	1.2300	BDL	2.9000	4.5000	BDL	6.1000
22957	81/ 4/ 4	SW	.2400	BDL	1.4000	2.7000	BDL	3.9000
22957	81/ 4/10	S	.4200	.0100	1.5000	4.5000	BDL	3.800
22957	81/ 4/16	SW	.3500	BDL	1.7000	4.7000	BDL	4.3000
22957	81/ 5/ 4	SSE	.2100	BDL	4.6000	6.5000	BDL	12.7000
22957	81/ 5/16	NNW	.1700	BDL	1.4000	1.3000	BDL	3.7000
22957	81/ 6/ 3	SSW	.2400	BDL	4.3000	3.0000	BDL	11.5000
22957	81/ 6/27	S	.5800	BDL	.5000	1.0000	BDL	2.0000
22957	81/ 7/ 3	SSE	.1300	.0100	1.0000	2.2000	BDL	6.6000
22957	81/ 7/21	NNW	.0800	.0100	2.7000	3.6000	.1000	8.7000
22957	81/ 8/ 2	SSW	.1100	.0100	6.2000	4.2000	.1000	27.7000
22957	81/ 8/ 8	S	.4400	.0100	2.1000	2.8000	BDL	9.9000
22957	81/ 9/ 1	S	.0800	BDL	3.6000	2.5000	.1000	12.3000
22957	81/ 9/25	SSW	.3200	.0100	1.0000	5.1000	BDL	3.7000
22957	81/10/13	NE	.5600	.0100	1.7000	6.6000	.1000	5.2000
22957	81/10/25	S	.1000	.0100	1.2000	2.7000	BDL	3.9000
22957	81/11/12	NE	.0900	.0100	.5000	1.4000	BDL	1.7000
22957	81/12/12	NW	1.2400	.0100	.4000	1.2000	BDL	2.400
22957	81/12/24	SW	.6400	.0100	1.2000	5.7000	.1000	5.300
ARITH MEAN			.3835	.0275	2.0348	3.3348	.1000	6.6522
STD DEV			.3203	.0336	1.4858	1.6196	.0000	5.5822
GEO MEAN			.2774	.0168	1.5769	2.9193	.1000	5.1619
MAXIMUM			1.2400	.1320	6.2000	6.6000	.1000	27.7000
MINIMUM			.0800	.0100	.4000	1.0000	.1000	1.7000
# OF SAMPLE			23	15	23	23	5	23

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22959	81/ 3/17	NW	.3900	BDL	.9000	2.1000	BDL	2.400
22959	81/ 3/23	NNE	1.2600	BDL	2.9000	5.2000	BDL	7.700
22959	81/ 4/ 4	SW	.3800	BDL	1.7000	2.9000	BDL	5.0000
22959	81/ 4/10	S	.2800	BDL	1.5000	4.1000	BDL	3.8000
22959	81/ 4/16	SW	.2800	BDL	1.8000	4.0000	BDL	4.4000
22959	81/ 5/ 4	SSE	.1200	BDL	3.4000	3.3000	BDL	11.6000
22959	81/ 5/16	NNW	.2000	BDL	1.5000	1.6000	BDL	4.2000
22959	81/ 6/ 3	SSW	.2400	BDL	4.8000	1.9000	BDL	11.4000
22959	81/ 6/27	S	.3300	BDL	.2000	1.3000	BDL	1.3000
22959	81/ 7/ 3	SSE	.1300	.0100	1.8000	2.3000	.1000	8.2000
22959	81/ 7/21	NNW	.3000	.0100	4.7000	2.7000	.1000	14.7000
22959	81/ 8/ 2	SSW	BDL	BDL	4.7000	.5000	.1000	27.8000
22959	81/ 8/ 8	S	.0900	BDL	2.6000	2.6000	.1000	8.9000
22959	81/ 9/ 1	S	.0100	BDL	3.3000	2.3000	.1000	11.5000
22959	81/ 9/25	SSW	.1900	.0100	.7000	3.7000	BDL	3.0000
22959	81/10/13	NE	.2900	.0100	1.6000	6.0000	BDL	6.0000
22959	81/10/25	S	.0200	BDL	1.2000	1.9000	BDL	4.5000
22959	81/11/12	NE	.3200	.0100	.5000	1.7000	BDL	2.8000
22959	81/12/12	NW	1.0600	.0100	.3000	1.1000	BDL	2.5000
22959	81/12/24	SW	.0900	BDL	1.4000	4.7000	.1000	3.7000
ARITH MEAN			.2992	.0100	2.0750	2.7950	.1000	7.2700
STD DEV			.3115	.0000	1.4184	1.4062	.0000	5.9637
GEO MEAN			.1625	.0100	1.5403	2.4179	.1000	5.5619
MAXIMUM			1.2600	.0100	4.8000	6.0000	.1000	27.8000
MINIMUM			.0050	.0100	.2000	.5000	.1000	1.3000
# OF SAMPLE			20	6	20	20	6	20

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22961	81/ 1/16	NNE	.3900	BDL	5.2000	5.2000	BDL	14.1000
22961	81/ 1/28	NE	.3900	BDL	1.6000	3.7000	BDL	3.8000
22961	81/ 3/17	NW	.3000	BDL	.6000	1.5000	BDL	2.5000
22961	81/ 3/23	NNE	.9900	.0170	2.9000	5.5000	BDL	6.8000
22961	81/ 4/ 4	SW	.5900	.0350	1.0000	3.2000	BDL	5.2000
22961	81/ 4/10	S	.7300	.0610	.6000	5.0000	BDL	5.2000
22961	81/ 5/ 4	SSE	.3200	BDL	3.3000	6.4000	BDL	13.2000
22961	81/ 5/16	NNW	.2000	BDL	1.4000	1.9000	BDL	4.0000
22961	81/ 6/ 3	SSW	.3200	BDL	4.7000	1.3000	BDL	12.3000
22961	81/ 6/27	S	.4500	BDL	.3000	3.2000	BDL	3.1000
22961	81/ 7/ 3	SSE	.2400	.0100	1.9000	3.1000	BDL	6.8000
22961	81/ 7/21	NNW	.1300	.0100	3.5000	5.5000	BDL	10.9000
22961	81/ 8/ 2	SSW	BDL	.0100	6.3000	.2000	BDL	29.200
22961	81/ 8/ 8	S	.0200	BDL	2.5000	2.4000	BDL	8.900
22961	81/ 9/ 1	S	.0100	.0100	2.9000	1.2000	BDL	11.800
22961	81/ 9/25	SSW	.4800	.0100	.5000	5.2000	BDL	3.8000
22961	81/10/13	NE	.4600	.0100	1.5000	5.9000	BDL	5.6000
22961	81/10/25	S	.1700	.0100	1.3000	2.6000	BDL	3.9000
22961	81/11/12	NE	.1500	.0100	.5000	1.6000	BDL	2.1000
22961	81/12/12	NW	.6400	.0100	.4000	1.2000	BDL	2.2000
22961	81/12/24	SW	.1700	.0100	1.0000	4.9000	BDL	3.9000
ARITH MEAN			.3407	.0164	2.0905	3.3667	N/A	7.5857
STD DEV			.2461	.0145	1.6733	1.8344	N/A	6.1107
GEO MEAN			.2047	.0132	1.4719	2.6757	N/A	5.9251
MAXIMUM			.9900	.0610	6.3000	6.4000	N/A	29.2000
MINIMUM			.0050	.0100	.3000	.2000	N/A	2.1000
# OF SAMPLE			21	13	21	21	0	21

WHATMAN 41 FILTER - 1981 PARTICULATE IONS DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CL-	F-	NH4	NO3	P	SO4
22963	81/ 7/ 3	SSE	.6800	.0100	.4000	3.8000	.1000	9.0000
22963	81/ 7/21	NNW	.0900	.0100	3.1000	3.3000	.1000	9.4000
22963	81/ 8/ 2	SSW	BDL	BDL	8.2000	.3000	.1000	31.1000
22963	81/ 8/ 8	S	.0600	.0100	2.5000	3.1000	BDL	9.6000
22963	81/ 9/ 1	S	BDL	.0100	3.0000	2.4000	BDL	14.1000
22963	81/ 9/25	SSW	.5000	.0100	.7000	6.0000	BDL	3.9000
22963	81/10/13	NE	1.6700	.0100	2.2000	10.2000	.1000	7.2000
22963	81/10/25	S	.3400	.0100	1.7000	3.4000	BDL	4.8000
22963	81/11/12	NE	.4000	.0100	.7000	2.3000	BDL	2.6000
22963	81/12/12	NW	.4600	BDL	.9000	1.6000	BDL	2.6000
22963	81/12/24	SW	.2500	.0100	1.9000	6.6000	BDL	3.8000
ARITH MEAN			.4055	.0091	2.3000	3.9091	.1000	8.9182
STD DEV			.4527	.0019	2.0715	2.6235	.0000	7.8086
GEO MEAN			.1545	.0088	1.6452	2.9393	.1000	6.7058
MAXIMUM			1.6700	.0100	8.2000	10.2000	.1000	31.1000
MINIMUM			.0050	.0050	.4000	.3000	.1000	2.6000
# OF SAMPLE			11	11	11	11	4	11

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22904	81/ 1/16	NNE	8.00	2.30	.288
22904	81/ 2/15	SSW	8.10	3.00	.370
22904	81/ 2/27	SSE	3.20	1.00	.313
22904	81/ 3/17	NW	1.80	.20	.111
22904	81/ 3/23	NNE	4.90	1.00	.204
22904	81/ 4/ 4	SW	11.00	1.40	.127
22904	81/ 4/10	S	6.50	1.50	.231
22904	81/ 4/16	SW	4.20	.90	.214
22904	81/ 6/ 3	SSW	5.20	.30	.058
22904	81/ 6/27	S	4.90	.60	.122
22904	81/ 7/ 3	SSE	3.60	.80	.222
22904	81/ 7/ 3	SSE	3.60	.80	.222
22904	81/ 7/21	NNW	7.40	.30	.041
22904	81/ 8/ 8	S	5.00	.10	.020
22904	81/ 9/ 1	S	6.00	.80	.133
22904	81/ 9/25	SSW	6.20	1.20	.194
22904	81/10/13	NE	6.50	2.00	.308
22904	81/10/25	S	3.60	1.00	.278
22904	81/11/12	NE	3.50	.20	.057
22904	81/12/12	NW	2.40	.20	.083
22904	81/12/24	SW	3.50	.50	.143
	ARITH MEAN		5.20	.96	
	STD DEV		2.16	.74	
	GEO MEAN		4.76	.68	
	MAXIMUM		11.00	3.00	
	MINIMUM		1.80	.10	
	# OF SAMPLE		21	21	

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22951	81/ 1/16	NNE	8.60	2.20	.256
22951	81/ 1/28	NE	1.10	.40	.364
22951	81/ 2/15	SSW	13.10	2.50	.191
22951	81/ 2/21	NW	3.10	.20	.065
22951	81/ 2/27	SSE	4.20	.50	.119
22951	81/ 3/17	NW	3.20	.40	.125
22951	81/ 3/23	NNE	7.20	1.70	.236
22951	81/ 4/ 4	SW	11.50	.60	.052
22951	81/ 4/10	S	9.00	.90	.100
22951	81/ 4/16	SW	6.50	.70	.108
22951	81/ 5/ 4	SSE	7.50	1.50	.200
22951	81/ 5/16	NNW	1.90	.40	.211
22951	81/ 6/ 3	SSW	4.30	.90	.209
22951	81/ 6/27	S	5.00	.40	.080
22951	81/ 7/ 3	SSE	4.60	.60	.130
22951	81/ 7/21	NNW	7.70	.20	.026
22951	81/ 8/ 2	SSW	7.30	.80	.110
22951	81/ 8/ 8	S	5.80	.70	.121
22951	81/ 9/ 1	S	7.20	.30	.042
22951	81/ 9/25	SSW	6.00	.70	.117
22951	81/10/13	NE	5.00	.60	.120
22951	81/10/25	S	3.50	.80	.229
22951	81/11/12	NE	3.80	.70	.184
22951	81/12/12	NW	2.50	.40	.160
	ARITH MEAN		5.82	.80	
	STD DEV		2.86	.58	
	GEO MEAN		5.07	.64	
	MAXIMUM		13.10	2.50	

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22952	81/ 1/16	NNE	8.00	2.50	.313
22952	81/ 1/28	NE	2.10	.60	.286
22952	81/ 2/21	NW	2.10	.40	.190
22952	81/ 2/27	SSE	2.20	1.20	.545
22952	81/ 3/17	NW	3.20	.50	.156
22952	81/ 3/23	NNE	3.80	1.00	.263
22952	81/ 4/ 4	SW	9.10	.70	.077
22952	81/ 4/10	S	5.80	1.40	.241
22952	81/ 4/16	SW	3.30	1.20	.364
22952	81/ 5/16	NNW	5.10	.40	.078
22952	81/ 6/ 3	SSW	4.20	1.00	.238
22952	81/ 6/27	S	9.10	.70	.077
22952	81/ 7/ 3	SSE	3.30	.60	.182
22952	81/ 7/21	NNW	7.80	.90	.115
22952	81/ 8/ 2	SSW	7.50	1.30	.173
22952	81/ 8/ 8	S	3.30	.90	.273
22952	81/ 9/ 1	S	6.00	.70	.117
22952	81/ 9/25	SSW	6.20	1.50	.242
22952	81/10/13	NE	6.10	1.60	.262
22952	81/10/25	S	3.60	.50	.139
22952	81/12/12	NW	2.20	.30	.136
ARITH MEAN			4.95	.95	
STD DEV			2.28	.51	
GEO MEAN			4.43	.83	
MAXIMUM			9.10	2.50	
MINIMUM			2.10	.30	
# OF SAMPLE			21	21	

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22953	81/ 1/16	NNE	9.30	2.50	.269
22953	81/ 1/28	NE	2.20	.50	.227
22953	81/ 2/15	SSW	10.40	2.40	.231
22953	81/ 2/21	NW	2.40	.60	.250
22953	81/ 2/27	SSE	4.10	1.50	.366
22953	81/ 3/17	NW	4.40	.60	.136
22953	81/ 3/23	NNE	3.20	.60	.188
22953	81/ 4/ 4	SW	11.70	1.40	.120
22953	81/ 4/10	S	7.00	1.50	.214
22953	81/ 4/16	SW	3.70	1.40	.378
22953	81/ 5/ 4	SSE	5.40	1.50	.278
22953	81/ 5/16	NNW	2.50	.40	.160
22953	81/ 6/ 3	SSW	4.20	1.30	.310
22953	81/ 6/27	S	5.00	.80	.160
22953	81/ 7/ 3	SSE	3.50	.40	.114
22953	81/ 7/21	NNW	7.20	.70	.097
22953	81/ 8/ 2	SSW	6.90	.60	.087
22953	81/ 8/ 8	S	3.50	.80	.229
22953	81/ 9/ 1	S	5.70	.40	.070
22953	81/ 9/25	SSW	5.50	.80	.145
22953	81/10/13	NE	6.90	1.10	.159
22953	81/10/25	S	3.70	.70	.189
22953	81/11/12	NE	2.90	.80	.276
22953	81/12/12	NW	1.80	.00	.000
22953	81/12/24	SW	2.60	.30	.115
ARITH MEAN			5.03	.94	
STD DEV			2.56	.60	

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22955	81/ 1/16	NNE	8.20	2.70	.329
22955	81/ 1/28	NE	1.60	.80	.500
22955	81/ 2/15	SSW	8.90	2.10	.236
22955	81/ 2/21	NW	2.10	.70	.333
22955	81/ 2/27	SSE	4.70	1.20	.255
22955	81/ 3/17	NW	3.00	.50	.167
22955	81/ 3/23	NNE	4.80	1.20	.250
22955	81/ 4/ 4	SW	9.80	1.20	.122
22955	81/ 4/10	S	5.40	2.20	.407
22955	81/ 4/16	SW	3.20	1.50	.469
22955	81/ 5/ 4	SSE	6.40	1.70	.266
22955	81/ 6/ 3	SSW	3.80	.90	.237
22955	81/ 7/ 3	SSE	4.00	.40	.100
22955	81/ 7/21	NNW	7.90	1.30	.165
22955	81/ 8/ 2	SSW	7.10	1.00	.141
22955	81/ 8/ 8	S	3.90	.50	.128
22955	81/ 9/ 1	S	6.10	.80	.131
22955	81/ 9/25	SSW	5.20	1.40	.269
22955	81/10/13	NE	6.00	1.60	.267
22955	81/10/25	S	2.90	.60	.207
22955	81/11/12	NE	4.00	1.40	.350
22955	81/12/12	NW	3.90	1.80	.462
22955	81/12/24	SW	2.60	.70	.269

ARITH MEAN	5.02	1.23
STD DEV	2.18	.59
GEO MEAN	4.55	1.09
MAXIMUM	9.80	2.70
MINIMUM	1.60	.40
# OF SAMPLE	23	23

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22957	81/ 1/16	NNE	9.00	2.40	.267
22957	81/ 1/28	NE	2.50	1.10	.440
22957	81/ 2/15	SSW	10.40	2.40	.231
22957	81/ 2/21	NW	2.80	.80	.286
22957	81/ 2/27	SSE	4.80	1.70	.354
22957	81/ 3/17	NW	2.80	1.20	.429
22957	81/ 3/23	NNE	4.40	1.10	.250
22957	81/ 4/ 4	SW	9.30	1.40	.151
22957	81/ 4/10	S	7.60	1.40	.184
22957	81/ 4/16	SW	4.50	1.00	.222
22957	81/ 5/ 4	SSE	7.30	1.30	.178
22957	81/ 5/16	NNW	2.00	.40	.200
22957	81/ 6/ 3	SSW	3.50	1.30	.371
22957	81/ 6/27	S	5.00	.20	.040
22957	81/ 7/ 3	SSE	7.40	.30	.041
22957	81/ 7/21	NNW	8.50	.20	.024
22957	81/ 8/ 2	SSW	7.70	.60	.078
22957	81/ 8/ 8	S	10.60	3.10	.292
22957	81/ 9/ 1	S	10.50	1.00	.095
22957	81/ 9/25	SSW	5.50	1.20	.218
22957	81/10/13	NE	5.50	1.30	.236
22957	81/10/25	S	4.00	1.10	.275
22957	81/11/12	NE	3.40	.70	.206
22957	81/12/12	NW	2.50	.30	.120
22957	81/12/24	SW	3.40	.40	.118

ARITH MEAN	5.80	1.12
STD DEV	2.74	.71
GEO MEAN	5.14	.88

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22959	81/ 1/28	NE	1.30	.80	.615
22959	81/ 2/15	SSW	10.30	3.20	.311
22959	81/ 2/21	NW	1.50	.70	.467
22959	81/ 2/27	SSE	2.20	.90	.409
22959	81/ 3/17	NW	3.30	.80	.242
22959	81/ 3/23	NNE	4.80	1.50	.313
22959	81/ 4/ 4	SW	10.50	1.40	.133
22959	81/ 4/10	S	3.10	1.50	.294
22959	81/ 4/16	SW	3.50	1.20	.343
22959	81/ 5/ 4	SSE	5.20	1.30	.250
22959	81/ 5/16	NNW	2.30	.70	.304
22959	81/ 6/ 3	SSW	7.20	1.50	.208
22959	81/ 6/27	S	5.50	.50	.091
22959	81/ 7/ 3	SSE	15.00	.50	.033
22959	81/ 7/21	NNW	9.60	.60	.063
22959	81/ 8/ 2	SSW	9.10	.80	.088
22959	81/ 8/ 8	S	5.30	.40	.075
22959	81/ 9/ 1	S	6.40	.70	.141
22959	81/ 9/25	SSW	5.30	.40	.075
22959	81/10/13	NE	5.80	.70	.155
22959	81/10/25	S	3.90	.80	.205
22959	81/11/12	NE	2.30	.30	.130
22959	81/12/12	NW	1.40	.10	.071
22959	81/12/24	SW	2.80	.00	.000
ARITH MEAN			5.40	.90	
STD DEV			3.37	.64	
GEO MEAN			4.41	.77	
MAXIMUM			15.00	3.20	
MINIMUM			1.30	.00	
# OF SAMPLE			24	24	

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22961	81/ 1/16	NNE	8.30	2.40	.289
22961	81/ 1/28	NE	1.80	.50	.278
22961	81/ 2/15	SSW	10.50	2.80	.267
22961	81/ 2/21	NW	2.10	.10	.048
22961	81/ 2/27	SSE	3.50	1.00	.286
22961	81/ 3/17	NW	2.50	.10	.040
22961	81/ 3/23	NNE	6.00	1.40	.233
22961	81/ 4/ 4	SW	11.00	1.20	.109
22961	81/ 4/10	S	8.90	1.70	.191
22961	81/ 5/ 4	SSE	8.40	2.00	.238
22961	81/ 5/16	NNW	3.10	.20	.065
22961	81/ 6/ 3	SSW	5.50	.70	.127
22961	81/ 6/27	S	7.10	1.20	.169
22961	81/ 7/ 3	SSE	4.70	1.20	.255
22961	81/ 7/21	NNW	8.30	.40	.048
22961	81/ 8/ 2	SSW	8.90	.70	.079
22961	81/ 9/ 1	S	5.70	.60	.105
22961	81/ 9/25	SSW	7.00	1.40	.200
22961	81/10/13	NE	6.50	.60	.092
22961	81/10/25	S	4.20	.30	.071
22961	81/11/12	NE	3.50	.50	.143
22961	81/12/12	NW	2.00	.20	.100
22961	81/12/24	SW	2.50	.90	.360
ARITH MEAN			5.74	.96	
STD DEV			2.79	.72	
GEO MEAN			4.93	[illegible]	

1981 CARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	CT	CF	RATIO (CF/CT)
22963	81/ 7/ 3	SSE	18.70	1.70	.091
22963	81/ 7/21	NNW	6.40	.70	.109
22963	81/ 8/ 2	SSW	7.20	1.00	.139
22963	81/ 8/ 8	S	3.80	.30	.079
22963	81/ 9/ 1	S	4.30	.70	.163
22963	81/ 9/25	SSW	6.30	1.00	.159
22963	81/10/13	NE	6.80	1.30	.191
22963	81/10/25	S	3.60	.60	.167
22963	81/11/12	NE	3.70	.60	.162
22963	81/12/12	NW	2.40	.70	.292
22963	81/12/24	SW	2.70	.50	.185

ARITH MEAN	5.99	.83
STD DEV	4.33	.38
GEO MEAN	5.03	.75
MAXIMUM	18.70	1.70
MINIMUM	2.40	.30
# OF SAMPLE	11	11

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22901	80/ 1/ 1	WNW	.10	.04	.08	.38	.04
22901	80/ 2/21	ENE	.29	.09	.11	.32	.15
22901	80/ 3/10	SSW	.14	.08	.05	.19	.07
22901	80/ 3/28	NE	.13	.05	.06	.26	.08
22901	80/ 4/ 9	S	.10	.04	.03	.27	.01
22901	80/ 4/21	NW	.05	.02	.02	.03	.02
22901	80/ 5/ 9	W	.09	.01	.02	.07	.03
22901	80/ 5/21	NE	.25	.07	.07	.12	.08
22901	80/ 6/ 8	NW	.07	.02	.03	.14	.02
22901	80/ 6/14	SSW	.67	.27	.26	.28	.29
22901	80/ 7/ 2	NW	BDL	BDL	BDL	BDL	BDL
22901	80/ 7/ 8	NW	BDL	BDL	BDL	BDL	BDL
22901	80/ 8/31	SW	BDL	BDL	BDL	BDL	BDL
22901	80/ 9/12	NE	BDL	BDL	BDL	BDL	BDL
22901	80/ 9/18	S	BDL	BDL	BDL	BDL	BDL
22901	80/10/ 6	W	BDL	BDL	BDL	BDL	BDL
22901	80/12/17	SW	BDL	BDL	BDL	BDL	BDL
22901	80/12/29	N	.20	.10	.10	.40	.20
ARITH MEAN			.12	.04	.05	.14	.05
STD DEV			.16	.06	.06	.14	.08
GEO MEAN			.14	.03	.06	.18	.06
MAXIMUM			.67	.27	.26	.40	.29
MINIMUM			.07	.01	.02	.03	.01
# OF SAMPLE			18	18	18	18	18

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22904	80/ 1/ 1	WNW	.11	N/A	.01	.07	.02
22904	80/ 1/10	E	.19	.04	.06	.21	.08
22904	80/ 2/ 9	NW	.09	.02	.03	.11	.04
22904	80/ 2/21	ENE	.28	.08	.11	.64	.16
22904	80/ 3/10	SSW	.14	.02	.05	.11	.03
22904	80/ 3/22	NW	.12	.03	.04	.20	.04
22904	80/ 4/ 9	S	.09	.07	.02	.07	.03
22904	80/ 4/21	NW	1.44	N/A	.04	.09	.06
22904	80/ 5/21	NE	.18	.08	.07	.30	.11
22904	80/ 6/ 8	NW	.10	.01	.01	.05	.02
22904	80/ 6/14	SSW	1.44	.44	.39	.48	.45
22904	80/ 8/ 7	NW	BDL	BDL	BDL	BDL	BDL
22904	80/ 8/31	SW	.10	BDL	BDL	.10	BDL
22904	80/ 9/12	NE	BDL	BDL	BDL	BDL	BDL
22904	80/10/30	SW	.10	BDL	BDL	.10	.10
22904	80/12/17	SW	.13	.01	.01	.24	.08
22904	80/12/29	N	.30	.10	.18	.71	.26
ARITH MEAN			.28	.06	.06	.20	.09
STD DEV			.43	.11	.09	.21	.11
GEO MEAN			.19	.04	.04	.16	.07
MAXIMUM			1.44	.44	.39	.71	.45
MINIMUM			.09	.01	.01	.05	.02
# OF SAMPLE			17	15	17	17	17

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22951	80/ 1/ 1	WNW	.11	N/A	.04	.14	.04
22951	80/ 1/10	E	.16	.06	.11	.48	.15
22951	80/ 2/ 9	NW	.07	N/A	.03	.27	.05
22951	80/ 2/21	ENE	.26	.09	.12	.91	.20
22951	80/ 3/10	SSW	.15	.04	.07	.28	.10
22951	80/ 3/28	NE	.11	.04	.05	.17	.08
22951	80/ 4/ 9	S	.12	.06	.07	.79	.04
22951	80/ 4/21	NW	.10	.03	.05	.46	.03
22951	80/ 5/ 9	W	.10	N/A	.04	.16	.03
22951	80/ 5/21	NE	.20	.05	.07	.23	.11
22951	80/ 6/ 8	NW	.10	N/A	.01	.08	.01
22951	80/ 6/14	SSW	.50	.17	.09	.28	.20
22951	80/ 7/ 2	NW	.11	.01	.03	.04	.03
22951	80/ 8/31	SW	.08	.01	.01	.05	.03
22951	80/ 9/18	S	.11	.03	.02	.12	.07
22951	80/10/30	SW	.18	.03	.06	.13	.18
22951	80/12/17	SW	.06	.03	.03	.13	.05
22951	80/12/29	N	.42	.21	.22	.73	.26
ARITH MEAN			.16	.06	.06	.30	.09
STD DEV			.12	.06	.05	.26	.07
GEO MEAN			.14	.04	.05	.21	.07
MAXIMUM			.50	.21	.22	.91	.26
MINIMUM			.06	.01	.01	.04	.01
# OF SAMPLE			18	14	18	18	18

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22952	80/ 1/ 1	WNW	.07	N/A	.05	.07	.07
22952	80/ 2/ 9	NW	.06	.03	.05	.22	.07
22952	80/ 2/21	ENE	.21	.07	.09	.24	.14
22952	80/ 3/10	SSW	.05	.02	.02	.10	.03
22952	80/ 3/28	NE	.11	.02	.05	.16	.05
22952	80/ 4/ 9	S	.07	.05	.04	.50	.03
22952	80/ 4/21	NW	.06	N/A	.01	.04	.02
22952	80/ 5/ 9	W	.06	.02	.01	.13	.02
22952	80/ 5/21	NE	.23	.09	.09	.27	.12
22952	80/ 6/ 8	NW	.05	N/A	.02	.11	.01
22952	80/ 6/14	SSW	.31	.17	.23	.31	.23
22952	80/ 7/ 2	NW	.05	.01	.03	.02	.03
22952	80/ 9/12	NE	.05	.01	.01	.01	.03
22952	80/10/ 6	W	.07	.02	.02	.06	.03
22952	80/10/30	SW	.13	.02	.03	.07	.04
22952	80/12/29	N	.25	.23	.22	.79	.24
ARITH MEAN			.11	.06	.06	.19	.07
STD DEV			.08	.07	.07	.20	.07
GEO MEAN			.09	.03	.04	.12	.05
MAXIMUM			.31	.23	.23	.79	.24
MINIMUM			.05	.01	.01	.01	.01
# OF SAMPLE			16	13	16	16	16

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22953	80/ 1/ 1	WNW	.16	N/A	.14	N/A	.05
22953	80/ 1/10	E	.18	.05	.09	.37	.12
22953	80/ 2/ 9	NW	.04	N/A	.01	N/A	.05
22953	80/ 2/21	ENE	.33	.06	.10	.41	.14
22953	80/ 3/10	SSW	.10	.03	.03	N/A	.04
22953	80/ 3/28	NE	.13	.04	.05	.15	.08
22953	80/ 4/ 9	S	.11	.04	.03	.17	.03
22953	80/ 4/21	NW	.05	N/A	.01	N/A	.01
22953	80/ 5/ 9	W	.05	N/A	.01	N/A	.01
22953	80/ 5/21	NE	.41	.15	.15	.28	.19
22953	80/ 6/ 8	NW	.04	N/A	N/A	N/A	.01
22953	80/ 6/14	SSW	.66	.35	.30	.44	.29
22953	80/ 7/ 2	NW	BLD	BLD	BLD	BLD	BLD
22953	80/ 7/ 8	NW	BLD	BLD	BLD	BLD	BLD
22953	80/ 8/31	SW	BLD	BLD	BLD	BLD	BLD
22953	80/ 9/12	NE	BLD	BLD	BLD	BLD	BLD
22953	80/ 9/18	S	BLD	BLD	BLD	BLD	BLD
22953	80/10/ 6	W	BLD	BLD	BLD	BLD	BLD
22953	80/10/30	SW	BLD	BLD	BLD	BLD	BLD
22953	80/12/17	SW	BLD	BLD	BLD	BLD	BLD
22953	80/12/29	N	.10	.10	.10	.30	.20
ARITH MEAN			.11	.05	.05	.14	.06
STD DEV			.16	.09	.08	.17	.08
GEO MEAN			.12	.07	.05	.28	.06
MAXIMUM			.66	.35	.30	.44	.29
MINIMUM			.04	.03	.01	.15	.01
# OF SAMPLE			21	16	20	15	21

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22955	80/ 2/21	ENE	.17	.04	.07	.15	.11
22955	80/ 3/10	SSW	.06	.02	.02	.13	.03
22955	80/ 3/28	NE	.09	.03	.06	.38	.04
22955	80/ 4/ 9	S	.12	.06	.05	.13	.05
22955	80/ 5/ 9	W	.07	.02	.01	N/A	.02
22955	80/ 6/ 8	NW	.06	N/A	N/A	N/A	.01
22955	80/ 6/14	SSW	.47	.20	.19	.24	.19
22955	80/ 7/ 2	NW	.06	.01	.02	.02	.02
22955	80/ 8/31	SW	.13	.07	.38	.12	.07
22955	80/ 9/18	S	.05	.02	.02	.06	.03
22955	80/10/30	SW	.11	.03	.06	.07	.06
22955	80/12/29	N	.14	.12	.15	.63	.19
ARITH MEAN			.13	.06	.09	.19	.07
STD DEV			.11	.05	.11	.17	.06
GEO MEAN			.10	.04	.05	.13	.05
MAXIMUM			.47	.20	.38	.63	.19
MINIMUM			.05	.01	.01	.02	.01
# OF SAMPLE			12	11	11	10	12

FL - Fluoranthene BAP - Benzo(a)pyrene BKF - Benzo(k)fluoranthene
BGP - Benzo(ghi)perylene BE - Perylene

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22957	80/ 1/ 1	WNW	.13	N/A	.01	.14	.02
22957	80/ 1/10	E	.20	.02	.07	.58	.11
22957	80/ 2/ 9	NW	.10	.02	.05	.15	.07
22957	80/ 2/21	ENE	.18	N/A	.09	.31	.15
22957	80/ 3/10	SSW	.12	.02	.04	.12	.04
22957	80/ 3/28	NE	.07	N/A	.02	.08	.03
22957	80/ 4/ 9	S	.11	.03	.02	.19	.02
22957	80/ 4/21	NW	.25	.08	.07	.31	.07
22957	80/ 5/21	NE	.26	.08	.10	.29	.13
22957	80/ 6/ 8	NW	.11	N/A	.02	.20	.01
22957	80/ 6/14	SSW	.78	.30	.28	.43	.29
22957	80/ 7/ 8	NW	.05	.01	.01	.04	.02
22957	80/ 8/31	SW	.08	.04	.04	.16	.08
22957	80/ 9/18	S	.08	.03	.01	.10	.03
22957	80/10/30	SW	.15	.01	.03	.05	.05
22957	80/12/17	SW	BDL	BDL	.10	.10	.10
22957	80/12/29	N	.01	BDL	.10	.40	.10
ARITH MEAN			.16	.05	.06	.21	.08
STD DEV			.17	.08	.06	.15	.07
GEO MEAN			.12	.03	.04	.17	.05
MAXIMUM			.78	.30	.28	.58	.29
MINIMUM			.01	.01	.01	.04	.01
# OF SAMPLE			17	13	17	17	17

1980 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22961	80/ 1/ 1	WNW	.07	N/A	.02	N/A	.02
22961	80/ 1/10	E	.27	.09	.14	.48	.19
22961	80/ 2/ 9	NW	.06	N/A	.02	.08	.03
22961	80/ 2/21	ENE	.23	.06	.09	.34	.13
22961	80/ 3/10	SSW	.15	.02	.03	.19	.05
22961	80/ 3/28	NE	.09	.02	.03	.08	.04
22961	80/ 4/ 9	S	.06	.02	.02	.13	.04
22961	80/ 5/21	NE	.39	.15	.17	.28	.24
22961	80/ 6/ 8	NW	.06	N/A	BDL	N/A	.01
22961	80/ 6/14	SSW	.70	.29	.30	.44	.33
22961	80/ 7/ 2	NW	BDL	BDL	BDL	BDL	BDL
22961	80/ 7/ 8	NW	.05	.01	.01	.05	.01
22961	80/ 8/31	SW	.06	.04	.03	.08	.04
22961	80/10/ 6	W	.09	.02	.03	.08	.04
22961	80/10/30	SW	.17	.02	.06	.08	.07
22961	80/12/17	SW	.12	.02	.06	.14	.09
ARITH MEAN			.16	.06	.06	.17	.08
STD DEV			.17	.08	.08	.15	.09
GEO MEAN			.12	.04	.03	.14	.05
MAXIMUM			.70	.29	.30	.48	.33
MINIMUM			.05	.01	.01	.05	.01
# OF SAMPLE			16	13	16	14	16

FL - Fluoranthene BAP - Benzo(a)pyrene BKF - Benzo(k)fluoranthene
BGP - Benzo(ghi)perylene BE - Perylene

1981 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22953	81/ 1/28	NE	.03	.02	.02	.04	.01
22953	81/ 2/15	SSW	.74	.27	.37	.52	.45
22953	81/ 2/27	SSE	.09	.02	.04	.09	.06
22953	81/ 3/23	NNE	.12	.02	.04	.10	.06
22953	81/ 4/ 4	SW	.01	.02	.01	.10	.03
22953	81/ 4/10	S	.08	.02	.03	.10	.05
22953	81/ 5/ 4	SSE	.27	.05	.10	.10	.11
22953	81/ 5/16	NNW	.02	.02	.01	.05	.01
22953	81/ 6/27	S	.12	.02	.01	.07	.02
22953	81/ 7/ 3	SSE	.15	.02	.01	.05	.02
22953	81/ 7/21	NNW	.13	.02	.01	.05	.02
22953	81/ 8/ 2	SSW	.13	.07	.06	.06	.06
22953	81/ 8/ 8	S	.10	.02	.01	.05	.01
22953	81/ 9/ 1	S	.12	.02	.03	.06	.05
22953	81/ 9/25	SSW	.14	.02	.04	.06	.05
22953	81/10/13	NE	.27	.14	.21	.60	.42
22953	81/10/25	S	.04	.02	.02	.06	.05
22953	81/11/12	NE	.04	.02	.02	.06	.06
22953	81/12/24	SW	.02	.02	.02	.05	.03
ARITH MEAN			.14	.04	.06	.12	.08
STD DEV			.16	.06	.09	.15	.12
GEO MEAN			.09	.03	.03	.08	.04
MAXIMUM			.74	.27	.37	.60	.45
MINIMUM			.01	.02	.01	.04	.01
# OF SAMPLE			19	19	19	19	19

1981 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22961	81/ 1/28	NE	.02	.02	.01	.06	.02
22961	81/ 2/15	SSW	.11	.18	.30	.28	.34
22961	81/ 2/27	SSE	.04	.02	.03	.11	.04
22961	81/ 3/23	NNE	.07	.07	.04	.36	.11
22961	81/ 4/ 4	SW	.01	.04	.03	.04	.05
22961	81/ 4/10	S	.05	.02	.04	.04	.06
22961	81/ 5/ 4	SSE	.08	.02	.05	.05	.06
22961	81/ 5/16	NNW	.02	.01	.01	.04	.01
22961	81/ 6/27	S	.02	.01	.01	.04	.01
22961	81/ 7/ 3	SSE	.05	.02	.01	.05	.02
22961	81/ 7/21	NNW	.03	.02	.01	.05	.02
22961	81/ 8/ 2	SSW	.18	.08	.08	.12	.09
22961	81/ 9/ 1	S	.08	.04	.05	.06	.05
22961	81/ 9/25	SSW	.14	.05	.07	.12	.09
22961	81/10/13	NE	.35	.26	.36	.22	.68
22961	81/10/25	S	.09	.03	.05	.07	.07
22961	81/11/12	NE	.01	.02	.04	.09	.07
22961	81/12/24	SW	.05	.03	.03	.06	.05
ARITH MEAN			.08	.05	.07	.10	.10
STD DEV			.08	.06	.10	.09	.16
GEO MEAN			.05	.03	.04	.08	.05
MAXIMUM			.35	.26	.36	.36	.68
MINIMUM			.01	.01	.01	.04	.01
# OF SAMPLE			18	18	18	18	18

1981 POLYNUCLEAR AROMATIC HYDROCARBON DATA (UG/M3)

STAT'N NUMBER	DATE	WIND DIRECT'N	FL	BAP	BKF	BGP	BE
22963	81/ 2/15	SSW	.34	.14	.30	.43	.40
22963	81/ 2/27	SSE	.03	.03	.03	.11	.07
22963	81/ 3/23	NNE	.02	.05	.08	.22	.12
22963	81/ 4/ 4	SW	.01	.07	.08	.22	.08
22963	81/ 4/10	S	.05	.02	.04	.06	.05
22963	81/ 5/ 4	SSE	.21	.05	.10	.17	.16
22963	81/ 5/20	NNE	.02	.02	.01	.06	.01
22963	81/ 6/27	S	.02	.02	.01	.06	.01
22963	81/ 7/ 3	SSE	.10	.03	.04	.06	.04
22963	81/ 7/21	NNW	.02	.01	.01	.05	.01
22963	81/ 8/ 2	SSW	.11	.06	.07	.11	.06
22963	81/ 8/ 8	S	.04	.01	.01	.06	.01
22963	81/ 9/ 1	S	.07	.05	.04	.06	.04
22963	81/ 9/25	SSW	.23	.08	.08	.20	.10
22963	81/10/13	NE	.26	.16	.23	.72	.54
22963	81/10/25	S	.06	.02	.02	.05	.06
22963	81/11/12	NE	.05	.02	.09	.18	.17
22963	81/12/24	SW	.08	.01	.04	.13	.07
ARITH MEAN			.10	.05	.07	.16	.11
STD DEV			.09	.04	.08	.16	.14
GEO MEAN			.06	.03	.04	.12	.06
MAXIMUM			.34	.16	.30	.72	.54
MINIMUM			.01	.01	.01	.05	.01
# OF SAMPLE			18	18	18	18	18

1981 POLYNUCLEAR AROMATIC HYDROCARBONS - COMPOSITE ANALYSIS

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22951	Northerly	(2)	.04	.03	.09	.34	.13
22951	Northerly	(2)	.03	.01	.01	.05	.02
22951	Northerly	(1)	.02	.01	.02	.05	.04
ARITH MEAN			.03	.02	.04	.15	.06
STANDARD DEVIATION			.008	.009	.036	.137	.048

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22952	Northerly	(4)	.03	.01	.02	.06	.03
22952	Northerly	(2)	.02	.01	.04	.08	.03
22952	Northerly	(2)	.01	.01	.02	.03	.02
ARITHMETIC MEAN			.020	.010	.027	.057	.027
STANDARD DEVIATION			.008	.000	.009	.021	.005

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22952	Southerly	(4)	.08	.04	.08	.18	.12
22952	Southerly	(2)	.23	.11	.19	.36	.22
22952	Southerly	(2)	.10	.06	.08	.13	.10
ARITHMETIC MEAN			.137	.070	.117	.223	.147
STANDARD DEVIATION			.066	.029	.052	.099	.052

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22955	Northerly	(2)	.03	.01	.02	.06	.04
22955	Northerly	(1)	.02	.01	.01	.04	.01
ARITHMETIC MEAN			.025	.010	.015	.050	.025
STANDARD DEVIATION			.005	.000	.005	.010	.015

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22955	Southerly	(3)	.29	.11	.19	.37	.28
22955	Southerly	(3)	.10	.04	.10	.14	.11
22955	Southerly	(2)	.04	.01	.05	.06	.07
ARITHMETIC MEAN			.143	.053	.113	.190	.153
STANDARD DEVIATION			.107	.042	.058	.131	.091

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22956	Northerly	(2)	.01	.01	.02	.10	.03
22956	Northerly	(2)	.03	.01	.01	.05	.02
ARITHMETIC MEAN			.020	.010	.020	.070	.030
STANDARD DEVIATION			.010	.000	.010	.040	.010

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22956	Southerly	(4)	.13	.04	.09	.14	.11
22956	Southerly	(3)	.04	.02	.03	.08	.04
22956	Southerly	(3)	.05	.02	.05	.15	.08
ARITHMETIC MEAN			.070	.030	.060	.120	.080
STANDARD DEVIATION			.050	.010	.030	.040	.040

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22957	Northerly	(4)	.04	.06	.04	.20	.06
22957	Northerly	(1)	.02	.01	.02	.04	.02
ARITHMETIC MEAN			.030	.035	.030	.120	.040
STANDARD DEVIATION			.010	.025	.010	.080	.020

STAT'N NUMBER	WIND DIRECTION		FL	BAP	BKF	BGP	BE
22957	Southerly	(4)	.20	.13	.23	.43	.28
22957	Southerly	(3)	.10	.01	.05	.10	.06
22957	Southerly	(3)	.02	.02	.14	.18	.17
ARITHMETIC MEAN			.107	.053	.140	.237	.170
STANDARD DEVIATION			.074	.054	.073	.141	.090

Concentrations are in ug/m3

Appendix 2

NEMP PRECIPITATION DATA COLLECTED DURING JANUARY TO DECEMBER 1981.

Data are presented on a monthly basis according to sampling station. All concentrations are expressed in mg/l except precipitation volume which is expressed in ml. Total acidity is expressed as $CaCO_3$. (N/A) represents missing or unavailable data. The NO_3^- and NH_4^+ concentrations are expressed as N-NO_3^- and N-NH_4^+ respectively.

1981 PRECIP TRACE METAL DATA (MG/L)

STAT'N NUMBER	DATE	CA	CD	CU	FE	K	MG	MN	NA	NI	PB	P	V	ZN	AL
22902	81/ 2/ 0	1.1700	.0012	.0090	.6890	.0100	.3250	.0220	.4000	.0020	.0170	.0170	BDL	.0380	.5040
22902	81/ 3/ 0	1.0100	.0002	.0080	.1200	.0200	.2350	.0120	.2200	.0020	.0120	.0050	BDL	.0250	.1510
22902	81/ 4/ 0	.3700	BDL	.0200	.0780	.0400	.0800	.0040	.0600	BDL	.0080	.0040	BDL	.0100	.0770
22902	81/ 5/ 0	.6400	.0002	.0030	.0570	.0600	.2050	.0080	.0700	BDL	.0120	.0270	BDL	.0150	.0270
22902	81/ 6/ 0	.1900	BDL	BDL	.0360	.1100	.0550	.0030	.0200	BDL	.0060	.0100	BDL	.0040	.0180
22902	81/ 7/ 0	.2800	BDL	.0010	.0600	.0300	.0700	.0040	.0100	BDL	.0100	.0080	BDL	.0090	.0500
22902	81/ 8/ 0	.4900	.0002	.0020	.0500	.0500	.1400	.0070	.0100	BDL	.0110	.0090	BDL	.0110	.0320
22902	81/ 9/ 0	.1600	BDL	.0020	.0270	.0100	.0300	.0020	.0200	BDL	.0080	.0040	BDL	.0050	.0120
22902	81/10/ 0	.3500	.0002	BDL	.0220	.3000	.0950	.0050	.0800	BDL	.0110	.1600	BDL	.0120	.0380
22902	81/11/ 0	.3600	.0004	.0020	.0220	.0200	.0900	.0040	.0700	.0010	.0160	.0030	BDL	.0140	.0230
22902	81/12/ 0	.2600	BDL	.0150	.0280	.0300	.0850	.0030	.0700	BDL	.0050	.0480	BDL	.0060	.0070
ARITH MEAN		.4800	.0004	.0057	.1081	.0618	.1282	.0067	.0936	.0017	.0105	.0268	N/A	.0135	.0854
STD DEV		.3164	.0004	.0063	.1858	.0801	.0860	.0055	.1119	.0005	.0036	.0440	N/A	.0095	.1300
GEO MEAN		.3966	.0003	.0029	.0552	.0363	.1036	.0053	.0508	.0016	.0099	.0118	N/A	.0110	.0392
MAXIMUM		1.1700	.0012	.0200	.6890	.3000	.3250	.0220	.4000	.0020	.0170	.1600	N/A	.0380	.5040
MINIMUM		.1600	.0002	.0005	.0220	.0100	.0300	.0020	.0100	.0010	.0050	.0030	N/A	.0040	.0070
# OF SAMPLE		11	6	11	11	11	11	11	11	3	11	11	0	11	11
VOL WT MEAN		.3747	.0001	.0042	.0634	.0675	.0994	.0051	.0531	.0002	.0096	.0260	N/A	.0103	.0491

1981 PRECIP TRACE METAL DATA (MG/L)

STAT'N NUMBER	DATE	CA	CD	CU	FE	K	MG	MN	NA	NI	PB	P	V	ZN	AL
22953	81/ 2/ 0	.3300	.0017	.0040	.2210	.0300	.0700	.0100	.1400	.0010	.0090	.0170	BDL	.0160	.2020
22953	81/ 3/ 0	5.0000	N/A	N/A	N/A	.1600	1.0000	N/A	.4900	N/A	N/A	N/A	N/A	N/A	N/A
22953	81/ 4/ 0	.7200	BDL	.0100	.1790	.0600	.1400	.0100	.1200	.0010	.0060	.0370	BDL	.0080	.1920
22953	81/ 5/ 0	1.7500	.0007	.0090	.2030	.1800	.3950	.0220	.2100	.0010	.0160	.0790	BDL	.0230	.1560
22953	81/ 6/ 0	.6800	BDL	.0010	.0740	.1000	.1100	.0070	.0400	BDL	.0050	.0300	BDL	.0090	.0570
22953	81/ 7/ 0	1.2500	.0002	.0020	.1340	.1400	.2200	.0120	.0500	BDL	.0130	.0500	BDL	.0140	.1170
22953	81/ 8/ 0	.4900	.0002	.0030	.0660	.1200	.1200	.0090	.0300	BDL	.0130	.0220	BDL	.0170	.0510
22953	81/ 9/ 0	.8600	.0002	.0020	.0490	.0500	.1100	.0060	.0600	BDL	.0110	.0820	BDL	.0090	.0330
22953	81/10/ 0	.6200	BDL	.0020	.0860	.1000	.0700	.0050	.0200	BDL	.0120	.0700	BDL	.0170	.0780
22953	81/11/ 0	.7200	.0003	.0020	.0500	.0400	.1000	.0050	.0800	BDL	.0140	.0100	BDL	.0110	.0340
22953	81/12/ 0	.4900	.0003	.0190	.0400	.0300	.0650	.0040	.0500	BDL	.0040	.0380	BDL	.0050	.0180
ARITH MEAN		1.1736	.0005	.0054	.1102	.0918	.2182	.0090	.1173	.0010	.0103	.0435	N/A	.0129	.0938
STD DEV		1.2680	.0005	.0054	.0651	.0511	.2634	.0050	.1296	.0000	.0039	.0246	N/A	.0052	.0650
GEO MEAN		.8479	.0004	.0036	.0922	.0765	.1442	.0079	.0761	.0010	.0094	.0359	N/A	.0118	.0710
MAXIMUM		5.0000	.0017	.0190	.2210	.1800	1.0000	.0220	.4900	.0010	.0160	.0820	N/A	.0230	.2020
MINIMUM		.3300	.0002	.0010	.0400	.0300	.0650	.0040	.0200	.0010	.0040	.0100	N/A	.0050	.0180
# OF SAMPLE		11	7	10	10	11	11	10	11	3	10	10	0	10	10
VOL WT MEAN		.8230	.0002	.0054	.1042	.0797	.1420	.0084	.0800	.0003	.0092	.0454	N/A	.0111	.0914

1981 PRECIP TRACE METAL DATA (MG/L)

STATION NUMBER	DATE	CA	CD	CU	FE	K	MG	MN	NA	NI	PB	P	V	ZN	AL
22954	81/ 2/ 0	.6900	BDL	.0040	.1010	.5800	.1100	.0080	.6000	.0010	.0040	.3000	BDL	.0230	.0940
22954	81/ 3/ 0	1.090	BDL	.0030	.1530	.0200	.2100	.0130	.1200	BDL	.0060	.0200	BDL	.0230	.1610
22954	81/ 4/ 0	.3700	BDL	.0100	.0680	.0200	.0700	.0040	.0900	BDL	.0060	.0060	BDL	.0060	.0090
22954	81/ 5/ 0	.4800	.0002	.0080	.0910	.0500	.1050	.0060	.1000	BDL	.0110	.0140	BDL	.0090	.0610
22954	81/ 6/ 0	.1900	BDL	BDL	.0310	.0300	.0350	.0020	.0200	BDL	.0040	.0020	BDL	.0040	.0220
22954	81/ 7/ 0	.2700	.0001	.0030	.0880	.0400	.0650	.0010	.0400	.0040	.0120	.0180	BDL	.0120	.0830
22954	81/ 8/ 0	.3500	.0002	.0020	.0290	.0500	.0700	.0040	.0200	BDL	.0110	.0120	BDL	.0090	.0280
22954	81/ 9/ 0	N/A	BDL	.0020	.0270	N/A	N/A	.0030	N/A	BDL	.0110	N/A	BDL	.0050	.0170
22954	81/10/ 0	.2800	BDL	BDL	.0270	.0300	.0400	.0020	.0200	BDL	.0070	.0070	BDL	.0080	.0200
22954	81/11/ 0	.2400	.0003	.0020	.0260	.0700	.0400	.0030	.0900	BDL	.0110	.0130	BDL	.0080	.0160
22954	81/12/ 0	.2800	.0001	.0160	.0450	.0300	.0600	.0030	.0400	BDL	.0040	.0280	BDL	.0050	.0300
ARITH MEAN		.4240	.0002	.0046	.0624	.0920	.0805	.0045	.1140	.0025	.0079	.0420	N/A	.0102	.0565
STD DEV		.2607	.0001	.0046	.0398	.1633	.0495	.0033	.1658	.0015	.0031	.0863	N/A	.0064	.0440
GEO MEAN		.3677	.0002	.0028	.0513	.0462	.0694	.0035	.0613	.0020	.0072	.0149	N/A	.0086	.0418
MAXIMUM		1.0900	.0003	.0160	.1530	.5800	.2100	.0130	.6000	.0040	.0120	.3000	N/A	.0230	.1610
MINIMUM		.1900	.0001	.0005	.0260	.0200	.0350	.0010	.0200	.0010	.0040	.0020	N/A	.0040	.0160
# OF SAMPLE		10	5	11	11	10	10	11	10	2	11	10	0	11	11
VOL WT MEAN		.3742	.0001	.0041	.0545	.0812	.0707	.0037	.0975	.0005	.0080	.0357	N/A	.0089	.0497

1981 PRECIP TRACE METAL DATA (MG/L)

STATION NUMBER	DATE	CA	CD	CU	FE	K	MG	MN	NA	NI	PB	P	V	ZN	AL
22956	81/ 2/ 0	.3000	.0002	.0050	.3370	.0200	.1100	.0060	.1300	.0020	.0070	.0030	BDL	.0140	.0460
22956	81/ 3/ 0	1.4400	.0004	.0980	.1580	.0400	.4150	.0130	.2000	.0020	.0170	.0210	BDL	.0280	.1220
22956	81/ 4/ 0	.5700	.0002	.0170	.1480	.0600	.1500	.0070	.0800	.0030	.0110	.0330	BDL	.0120	.1610
22956	81/ 5/ 0	.4300	.0002	.0040	.0720	.0600	.1300	.0040	.1000	BDL	.0090	.0220	BDL	.0070	.0690
22956	81/ 6/ 0	.2300	BDL	.0010	.0270	.0400	.0550	.0020	.0500	BDL	.0050	.0150	BDL	.0030	.0190
22956	81/ 7/ 0	.2800	BDL	.0020	.0400	.0200	.0700	.0030	.0400	BDL	.0090	.0200	BDL	.0060	.0510
22956	81/ 8/ 0	.3200	.0002	.0030	.0630	.0500	.0700	.0050	.0200	BDL	.0080	.0200	BDL	.0110	.0470
22956	81/ 9/ 0	.2600	.0002	.0020	.0840	.0800	.0550	.0030	.0300	BDL	.0110	.0220	BDL	.0060	.0200
22956	81/10/ 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22956	81/11/ 0	.4800	.0004	.0020	.0300	.0300	.1500	.0040	.1300	BDL	.0160	.0070	BDL	.0120	.0200
22956	81/12/ 0	.8000	BDL	.0080	.0410	.0300	.2300	.0030	.2200	BDL	.0040	.0350	BDL	.0030	.0130
ARITH MEAN		.5110	.0003	.0142	.1000	.0430	.1435	.0050	.1000	.0023	.0097	.0198	N/A	.0102	.0568
STD DEV		.3513	.0001	.0283	.0903	.0185	.1044	.0030	.0663	.0005	.0040	.0094	N/A	.0070	.0464
GEO MEAN		.4303	.0002	.0048	.0725	.0391	.1164	.0043	.0768	.0023	.0089	.0165	N/A	.0082	.0414
MAXIMUM		1.4400	.0004	.0980	.3370	.0800	.4150	.0130	.2200	.0030	.0170	.0350	N/A	.0280	.1610
MINIMUM		.2300	.0002	.0010	.0270	.0200	.0550	.0020	.0200	.0020	.0040	.0030	N/A	.0030	.0130
# OF SAMPLE		10	7	10	10	10	10	10	10	3	10	10	0	10	10
VOL WT MEAN		.4373	.0001	.0096	.0940	.0442	.1204	.0043	.0876	.0006	.0089	.0199	N/A	.0085	.0505

1981 PRECIP TRACE METAL DATA (MG/L)

STAT'N NUMBER	DATE	CA	CD	CU	FE	K	MG	MN	NA	NI	PB	P	V	ZN	AL
22958	81/ 2/ 0	.1500	.0001	.0040	.0470	.0100	.0550	.0020	.1000	BDL	.0060	.0080	BDL	.0080	.0050
22958	81/ 3/ 0	1.1200	.0014	.0090	.1410	.0300	.3100	.0010	.2300	.0020	.0140	.0130	BDL	.0250	.1560
22958	81/ 4/ 0	.3800	BDL	.0260	.2500	.0400	.1100	.0040	.0900	.0010	.0060	.0200	BDL	.0090	.1340
22958	81/ 5/ 0	.4200	.0004	.0100	.1110	.0800	.1300	.0050	.1200	BDL	.0090	.0200	BDL	.0090	.0490
22958	81/ 6/ 0	.2000	BDL	.0020	.0320	.0600	.0400	.0030	.0400	BDL	.0060	.0150	BDL	.0070	.0160
22958	81/ 7/ 0	.2900	BDL	.0010	.0760	.0300	.0700	.0030	.0100	BDL	.0080	.0100	BDL	.0060	.0570
22958	81/ 8/ 0	.3900	.0002	.0030	.0330	.0600	.0750	.0050	.0300	BDL	.0090	.0280	BDL	.0090	.0320
22958	81/ 9/ 0	.1800	.0002	.0030	.0210	.0100	.0300	.0020	.0200	BDL	.0080	.0100	BDL	.0040	.0140
22958	81/10/ 0	.3200	BDL	BDL	.0180	.0300	.0450	.0040	.0200	BDL	.0120	.0220	BDL	.0110	.0310
22958	81/11/ 0	.2200	.0004	.0010	.0160	.0300	.0450	.0020	.0500	BDL	.0100	.0050	BDL	.0110	.0080
22958	81/12/ 0	.3400	.0006	.0090	.0400	.0300	.1200	.0040	.0900	BDL	.0040	.0380	BDL	.0080	.0180
ARITH MEAN		.3645	.0005	.0062	.0714	.0373	.0936	.0032	.0727	.0015	.0084	.0172	N/A	.0097	.0473
STD DEV		.2542	.0004	.0071	.0684	.0205	.0758	.0013	.0612	.0005	.0028	.0093	N/A	.0052	.0488
GEO MEAN		.3108	.0003	.0034	.0486	.0313	.0742	.0029	.0504	.0014	.0079	.0148	N/A	.0088	.0283
MAXIMUM		1.1200	.0014	.0260	.2500	.0800	.3100	.0050	.2300	.0020	.0140	.0380	N/A	.0250	.1560
MINIMUM		.1500	.0001	.0005	.0160	.0100	.0300	.0010	.0100	.0010	.0040	.0050	N/A	.0040	.0050
# OF SAMPLE		11	7	11	11	11	11	11	11	2	11	11	0	11	11
VOL WT MEAN		.3196	.0002	.0054	.0655	.0362	.0795	.0032	.0583	.0002	.0080	.0166	N/A	.0085	.0420

1981 PRECIP TRACE METAL DATA (MG/L)

STAT'N NUMBER	DATE	CA	CD	CU	FE	K	MG	MN	NA	NI	PB	P	V	ZN	AL
22960	81/ 1/ 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22960	81/ 2/ 0	.1500	.0002	.0080	.1460	.0300	.0400	.0050	.0800	BDL	.0100	.0090	BDL	.0210	.1900
22960	81/ 3/ 0	1.4900	BDL	.0020	.1860	.0300	.3000	.0140	.1600	BDL	.0110	.0160	BDL	.0280	.1610
22960	81/ 4/ 0	.6300	BDL	.0220	.1190	.0200	.1250	.0060	.0600	.0010	.0080	.0060	BDL	.0100	.0780
22960	81/ 5/ 0	.5200	.0002	.0070	.0680	.0700	.1450	.0040	.1000	.0010	.0090	.0240	BDL	.0080	.0400
22960	81/ 6/ 0	.2300	BDL	BDL	.0380	.0300	.0600	.0030	.0200	.0020	.0050	.0040	BDL	.0140	.0330
22960	81/ 7/ 0	.3100	.0002	.0020	.0570	.0300	.0750	.0040	.0100	BDL	.0110	.0080	BDL	.0080	.0600
22960	81/ 8/ 0	.4900	.0003	.0020	.0650	.0900	.1400	.0090	.0200	BDL	.0110	.1550	BDL	.0130	.0400
22960	81/ 9/ 0	.3000	BDL	.0020	.0280	.0100	.0550	.0030	.0200	BDL	.0090	.0050	BDL	.0050	.0180
22960	81/10/ 0	.4400	.0001	BDL	.0390	.1100	.0450	.0030	.0200	BDL	.0080	.0200	BDL	.0080	.0330
22960	81/11/ 0	.4200	.0004	.0020	.0290	.0200	.0750	.0030	.0600	BDL	.0140	.0050	BDL	.0120	.0250
22960	81/12/ 0	.2400	.0002	.0080	.0260	.0300	.0550	.0020	.0300	BDL	.0060	.0400	BDL	.0080	.0120
ARITH MEAN		.4745	.0002	.0051	.0728	.0427	.1014	.0051	.0527	.0013	.0093	.0265	N/A	.0123	.0627
STD DEV		.3490	.0001	.0060	.0514	.0308	.0725	.0034	.0439	.0005	.0024	.0419	N/A	.0065	.0563
GEO MEAN		.3925	.0002	.0028	.0581	.0339	.0836	.0043	.0377	.0013	.0089	.0132	N/A	.0109	.0445
MAXIMUM		1.4900	.0004	.0220	.1860	.1100	.3000	.0140	.1600	.0020	.0140	.1550	N/A	.0280	.1900
MINIMUM		.1500	.0001	.0005	.0260	.0100	.0400	.0020	.0100	.0010	.0050	.0040	N/A	.0050	.0120
# OF SAMPLE		11	7	11	11	11	11	11	11	3	11	11	0	11	11
VOL WT MEAN		.4136	.0001	.0038	.0573	.0432	.0866	.0042	.0400	.0005	.0087	.0208	N/A	.0104	.0470

1981 PRECIP IONS DATA (MG/L)

STAT'N NUMBER	DATE	CL	NH3	NO3	N	SO4	ACID	PH	VOL
22902	81/ 2/ 0	.6400	.5600	.7700	.8300	4.8500	3.830	4.460	565
22902	81/ 3/ 0	.4700	1.0100	1.1400	1.2100	4.9500	4.550	4.310	810
22902	81/ 4/ 0	.2200	.6100	.6300	.6900	3.9000	4.680	4.210	1790
22902	81/ 5/ 0	.3100	.5700	.7200	.8400	6.2500	6.690	4.060	1300
22902	81/ 6/ 0	.0900	.4200	.4200	.5000	4.2500	5.440	4.110	2440
22902	81/ 7/ 0	.1500	.6700	.6500	.6500	6.3000	7.330	3.980	2630
22902	81/ 8/ 0	.1900	.7500	.7400	.8800	6.5000	7.000	3.950	3280
22902	81/ 9/ 0	.0600	.3700	.4600	.3900	3.8000	5.620	4.060	3630
22902	81/10/ 0	.2300	1.1100	.5300	1.7000	4.2500	3.080	4.670	2060
22902	81/11/ 0	.2100	.7400	.5800	.8800	4.1500	5.030	4.190	891
22902	81/12/ 0	.2300	.3800	.4400	.4300	2.5000	4.050	4.340	1190
ARITH MEAN		.2545	.6536	.6436	.8182	4.7000	5.209	4.169	
STD DEV		.1602	.2296	.1954	.3592	1.1788	1.302	N/A	
GEO MEAN		.2100	.6154	.6178	.7492	4.5442	5.043	4.213	
MAXIMUM		.6400	1.1100	1.1400	1.7000	6.5000	7.330	4.670	
MINIMUM		.0600	.3700	.4200	.3900	2.5000	3.080	3.950	
# OF SAMPLE		11	11	11	11	11	11	11	
VOL WT MEAN		.1908	.6293	.6017	.7678	4.8254	5.561	4.113	

1981 PRECIP IONS DATA (MG/L)

STAT'N NUMBER	DATE	CL	NH3	NO3	N	SO4	ACID	PH	VOL
22953	81/ 2/ 0	.3000	.9100	.8000	1.1700	4.0000	4.690	4.280	915
22953	81/ 3/ 0	1.0500	4.1500	2.7000	N/A	10.7000	N/A	7.150	200
22953	81/ 4/ 0	.2800	.9100	.6900	1.2500	4.8000	3.920	4.420	2860
22953	81/ 5/ 0	.8700	1.9700	1.3300	2.2200	11.2000	8.020	4.010	780
22953	81/ 6/ 0	.2100	.9800	.6800	1.1200	6.0000	5.230	4.180	2500
22953	81/ 7/ 0	.2800	1.2000	1.0900	1.3500	10.3000	8.790	3.890	1360
22953	81/ 8/ 0	.2400	.9800	.9500	1.0200	9.8500	10.400	3.740	1280
22953	81/ 9/ 0	.1500	1.0600	.8600	1.6000	6.8000	6.250	4.100	2950
22953	81/10/ 0	.5800	.5900	.7300	1.1800	4.6500	6.020	4.070	764
22953	81/11/ 0	.4000	.6300	.6900	.8100	3.9500	5.260	4.290	845
22953	81/12/ 0	.2600	.2620	.4900	.3800	2.7000	4.800	4.280	1430
ARITH MEAN		.4200	1.2402	1.0009	1.2100	6.8136	6.338	4.121	
STD DEV		.2786	1.0063	.5797	.4571	2.9872	1.969	N/A	
GEO MEAN		.3505	.9805	.8953	1.1127	6.1456	6.062	4.401	
MAXIMUM		1.0500	4.1500	2.7000	2.2200	11.2000	10.400	7.150	
MINIMUM		.1500	.2620	.4900	.3800	2.7000	3.920	3.740	
# OF SAMPLE		11	11	11	10	11	10	11	
VOL WT MEAN		.3004	.9836	.8222	1.2221	6.3392	6.022	4.113	

pH was converted to the Hf ion, averaged, then converted back to pH
N/A - data not available

1981 PRECIP IONS DATA (MG/L)

STAT'N NUMBER	DATE	CL	NH3	NO3	N	SO4	ACID	PH	VOL
22954	81/ 2/ 0	.3700	1.0400	.6400	2.8400	6.9000	7.830	3.970	1340
22954	81/ 3/ 0	.3500	.0920	1.0100	1.2400	5.1000	4.580	4.300	815
22954	81/ 4/ 0	.2200	.5600	.5900	.6500	4.0000	4.670	4.190	2350
22954	81/ 5/ 0	.3100	.6000	.8700	.7600	7.5000	9.280	3.860	1120
22954	81/ 6/ 0	.1100	.5700	.7000	.6400	4.2000	5.450	4.100	2230
22954	81/ 7/ 0	.1700	.7900	.8100	.8500	7.4000	8.850	3.890	1920
22954	81/ 8/ 0	.2500	.7500	.9300	.9200	9.0500	11.600	3.680	1810
22954	81/ 9/ 0	.1000	.4400	.6200	N/A	4.6500	N/A	4.000	2900
22954	81/10/ 0	.1600	.4500	.5900	.5400	3.7500	5.610	4.080	2210
22954	81/11/ 0	.2200	.5100	.5600	.6800	3.4000	4.970	4.190	972
22954	81/12/ 0	.2400	.2200	.3200	.2800	2.0000	4.530	4.270	1300
ARITH MEAN		.2291	.5475	.6945	.9400	5.2682	6.737	4.009	
STD DEV		.0889	.2492	.1878	.6766	2.0478	2.358	N/A	
GEO MEAN		.2109	.4689	.6662	.7856	4.8535	6.369	4.048	
MAXIMUM		.3900	1.0400	1.0100	2.8400	9.0500	11.600	4.300	
MINIMUM		.1000	.0920	.3200	.2800	2.0000	4.530	3.680	
# OF SAMPLE		11	11	11	10	11	10	11	
VOL WT MEAN		.2038	.5617	.6803	.8799	5.2109	6.775	3.999	

1981 PRECIP IONS DATA (MG/L)

STAT'N NUMBER	DATE	CL	NH3	NO3	N	SO4	ACID	PH	VOL
22956	81/ 2/ 0	.2600	.2540	.5400	.3500	3.2000	5.060	4.180	1520
22956	81/ 3/ 0	.4900	1.1200	1.2700	1.4400	5.8500	4.390	4.390	855
22956	81/ 4/ 0	.2600	.6300	.6000	.9600	4.2000	4.220	4.320	1440
22956	81/ 5/ 0	.3300	.6200	.7400	.8200	6.4500	7.890	3.960	1350
22956	81/ 6/ 0	.1700	.6100	.5600	.6800	5.3000	6.860	4.020	2630
22956	81/ 7/ 0	.2000	.6500	.7300	.7000	7.1500	8.800	3.880	2030
22956	81/ 8/ 0	.1800	.6300	.7600	.8000	7.0000	9.150	3.800	960
22956	81/ 9/ 0	.0900	.4600	.6000	.5900	4.9500	6.530	4.040	2350
22956	81/10/ 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22956	81/11/ 0	.3200	.5500	.5700	.7000	4.2000	5.640	4.220	884
22956	81/12/ 0	.4100	.2060	.4800	.2500	2.7500	3.220	4.560	1450
ARITH MEAN		.2710	.5730	.6850	.7290	5.1050	6.176	4.081	
STD DEV		.1139	.2377	.2143	.3112	1.4496	1.912	N/A	
GEO MEAN		.2453	.5200	.6594	.6596	4.8820	5.868	4.137	
MAXIMUM		.4900	1.1200	1.2700	1.4400	7.1500	9.150	4.560	
MINIMUM		.0900	.2060	.4800	.2500	2.7500	3.220	3.800	
# OF SAMPLE		10	10	10	10	10	10	10	
VOL WT MEAN		.2423	.5483	.6506	.6851	5.1152	6.326	4.065	

pH was converted to the Hf ion, averaged, then converted back to pH
N/A - data not available

1981 PRECIP IONS DATA (MG/L)

STAT'N NUMBER	DATE	CL	NH3	NO3	N	SO4	ACID	PH	VOL
22958	81/ 2/ 0	.2300	.4900	.4800	.6100	3.1500	4.480	4.260	1270
22958	81/ 3/ 0	.5200	1.2900	1.1400	1.6800	5.6000	3.890	4.450	885
22958	81/ 4/ 0	.2200	.8700	.6100	1.1200	4.3000	4.030	4.360	1500
22958	81/ 5/ 0	.3100	.9300	.7700	1.1000	6.1500	6.460	4.090	1500
22958	81/ 6/ 0	.1400	.7100	.5500	.8100	4.9500	5.800	4.100	2330
22958	81/ 7/ 0	.1600	1.0100	.7800	1.0200	7.5500	7.590	3.960	2830
22958	81/ 8/ 0	.2200	1.3200	.8300	1.5200	8.5500	8.140	3.880	1210
22958	81/ 9/ 0	.0400	.7600	.5500	.8100	4.1000	4.850	4.170	2690
22958	81/10/ 0	.1600	1.0400	.7700	1.2500	4.3500	5.170	4.180	1780
22958	81/11/ 0	.1900	.6700	.5000	.8500	3.6500	4.840	4.230	1150
22958	81/12/ 0	.2600	.5300	.5100	.6000	2.7000	4.210	4.400	1580
ARITH MEAN		.2227	.8745	.6809	1.0336	5.0045	5.405	4.156	
STD DEV		.1155	.2643	.1908	.3323	1.7333	1.371	N/A	
GEO MEAN		.1915	.8341	.6572	.9820	4.7249	5.247	4.189	
MAXIMUM		.5200	1.3200	1.1400	1.6800	8.5500	8.140	4.450	
MINIMUM		.0400	.4900	.4800	.6000	2.7000	3.890	3.880	
# OF SAMPLE		11	11	11	11	11	11	11	
VOL WT MEAN		.1930	.8586	.6629	.9898	5.0794	5.564	4.135	

1981 PRECIP IONS DATA (MG/L)

STAT'N NUMBER	DATE	CL	NH3	NO3	N	SO4	ACID	PH	VOL
22960	81/ 1/ 0	N/A	N/A	N/A	N/A	N/A	N/A	3.820	70
22960	81/ 2/ 0	.2900	.3220	.4900	.5100	3.2500	5.470	4.150	505
22960	81/ 3/ 0	.4100	1.0100	1.0600	1.3900	5.9500	4.170	4.430	780
22960	81/ 4/ 0	.2300	.5600	.5900	.6500	4.2500	4.520	4.270	935
22960	81/ 5/ 0	.2800	.6400	.7700	.8200	6.4000	7.390	3.990	1430
22960	81/ 6/ 0	.0900	.4700	.4400	.5200	3.9500	5.150	4.110	2420
22960	81/ 7/ 0	.1500	.5900	.7000	.6000	6.8000	8.320	3.890	2140
22960	81/ 8/ 0	.2800	1.0500	1.1200	2.0000	11.7000	12.900	3.640	855
22960	81/ 9/ 0	.7700	.4100	.5500	.4400	4.4000	6.190	4.020	2490
22960	81/10/ 0	.1800	.4500	.6100	1.0500	4.4000	5.890	4.080	2100
22960	81/11/ 0	.2800	.6000	.6000	.7600	4.2500	5.240	4.140	833
22960	81/12/ 0	.1900	.3020	.4400	.3500	2.3500	4.510	4.250	1370
ARITH MEAN		.2864	.5822	.6700	.8264	5.2455	6.341	4.015	
STD DEV		.1733	.2359	.2201	.4673	2.4000	2.394	N/A	
GEO MEAN		.2475	.5398	.6387	.7247	4.8110	6.000	4.066	
MAXIMUM		.7700	1.0500	1.1200	2.0000	11.7000	12.900	4.430	
MINIMUM		.0900	.3020	.4400	.3500	2.3500	4.170	3.640	
# OF SAMPLE		11	11	11	11	11	11	12	
VOL WT MEAN		.2931	.5402	.6306	.7433	5.0749	6.333	4.032	

pH was converted to the Hf ion, averaged, then converted back to pH
N/A - data not available